No. 272 DECEMBER 1958 Vol. LXVIII

THE ECONOMIC JOURNAL

THE QUARTERLY JOURNAL OF THE ROYAL ECONOMIC SOCIETY

Edited by R. F. HARROD *and* E. A. G. ROBINSON
Assisted by R. C. O. MATTHEWS

I. ARTICLES

The Cardinal Utility which is Ordinal	W. J. BAUMOL	665
Alfred Marshall and the Competitive Firm	D. C. HAGUE	673
Some Marshallian Concepts, Especially the Representative Firm	J. A. MAXWELL	691
A Pyrrhic Victory	H. NEISSER	699
On Growth Models and the Neo-Classical Resurgence	R. EISNER	707
Concentration of Exports and Imports: An International Comparison	M. MICHAELY	722
Inflation, the Terms of Trade and the Share of Wages in National Income	G. MAYNARD	737
The Optimum Rate of Investment	B. HORVAT	747
An Economic Analysis of Fixed Investment	E. J. BROSTER	768

II. REVIEWS (For a List of Books Reviewed see inside cover) 780

III. NOTES AND MEMORANDA

Consistency Between Say's Identity and the Cambridge Equation	J. ENCARNACIÓN	827
Note on Mr. Gould's Discussion of Potential Surprise	M. B. NICHOLSON	830
Comment on Arrow and the "New Welfare" Economics	R. G. DAVIS	834
A Further Note on Finance and Taxation in Jamaica	D. F. MURRAY	835
Current Topics		840

IV. RECENT PERIODICALS AND NEW BOOKS 843

LONDON: MACMILLAN AND CO. LIMITED
NEW YORK: THE ST. MARTIN'S PRESS
PRICE TEN SHILLINGS NET

EASTERN MICHIGAN COLLEGE LIBRARY YPSILANTI

REVIEWS

		PAGE
ABBOTT (L.). *Quality and Competition*	By A. SILBERSTON	796
LE BOURVA (J.). *L'Inflation Française d'Après Guerre 1945–1949*	By A. J. BROWN	792
CLEMENTS (R. V.). *Managers*	By C. ERICKSON	806
COTGROVE (S. F.). *Technical Education and Social Change*	By J. E. VAIZEY	804
CREIGHTON (D.). *Harold Adams Innis*	By C. R. FAY	822
DAVISON (J. P.), SARGANT FLORENCE (P.), GRAY (B.) and ROSS (N. S.). *Productivity and Economic Incentives*	By H. S. KIRKALDY	801
EDDING (F.). *Internationale Tendenzen in der Entwicklung der Ausgaben für Schulen und Hochschulen*	By J. E. VAIZEY	804
FREEMAN (T. W.). *Pre-famine Ireland*	By J. E. VAIZEY	820
GABILLARD (J.). *La Fin de l'Inflation*	By A. J. BROWN	792
HABER (L. F.). *The Chemical Industry During the Nineteenth Century*	By C. WILSON	811
HAGUE (D. C.). *The Economics of Man-made Fibres*	By A. SILBERSTON	813
HAGUE (D. C.) (Ed.). *Stability and Progress in the World Economy*	By U. K. HICKS	824
HUGH-JONES (E. M.) (Ed.). *Human Relations and Modern Management*	By H. S. KIRKALDY	802
International Economic Papers, No. 7	By K. LANCASTER	794
KNIGHT (F. H.). *The History and Method of Economics*	By A. L. MACFIE	780
MAJUMDAR (T.). *The Measurement of Utility*	By E. J. MISHAN	786
MEADE (J. E.). *The Control of Inflation*	By P. BAREAU	790
SAVAGE (C. I.). *Inland Transport*	By G. WALKER	817
STRAUSS (E.). *Common Sense about the Common Market*	By B. TEW	799
STURMEY (S. G.). *The Economic Development of Radio*	By J. H. DUNNING	815
VAIZEY (J. E.). *The Costs of Education*	By H. MARQUAND	809
WILLIAMS (E. W.). *The Regulation of Rail–Motor Rate Competition*	By G. WALKER	819
Womanpower	By B. N. SEEAR	808

THE ECONOMIC JOURNAL

DECEMBER 1958

THE CARDINAL UTILITY WHICH IS ORDINAL[1]

DESPITE the frequent disclaimers,[2] the phrasing of many of the discussions of the Neumann–Morgenstern utility index continues to invite reading into them the mistaken view that the utility index is, or is intended to be, just another device for measuring neoclassical introspective utility, and differs from the latter only in being defined exclusively for risky propositions. As one who once fell into this trap, I am perhaps oversensitive to this matter. In this paper, I attempt to make clear the nature of the N-M index and its distinction from the measure which plays so great a role in the neoclassical literature. I shall show, in fact, that in the neoclassicist's sense, the N–M index turns out to be just an ordinal measure.

First, let us try to see what use its inventors and their successors have made of this important device. It is *not* the purpose of the Neumann–Morgenstern utility index to set up any sort of measure of introspective pleasure intensity.[3] Such a measure of "strength of feelings" is totally unnecessary in the theory of games for which the N–M utility theory was constructed. Rather the utility measure was set up for purposes of calculation, or rather of prediction (in the subtler sense of the word) to permit the theorist to *determine in the absence of the player* which of several risky propositions the player will *prefer*. For the solution of a duopoly game must predict which strategy each player will choose (prefer), and the theory must therefore be able to predict how each player will rank risky[4] strategic decisions.

The theory makes this prediction not by measuring subjective utility but by assuming preference patterns for the individual, patterns which have sometimes been described as "rational." It is assumed (in any of several

[1] I am heavily indebted to William Bowen, Robert Dorfman, Robert Kuenne and Richard Quandt for their very helpful comments and suggestions.

[2] See, *e.g.*, Milton Friedman and L. J. Savage, "The Expected Utility Hypothesis and the Measurability of Utility," *Journal of Political Economy*, Vol. 60, 1952, esp. p. 473.

[3] This is documented in and should have been made clear by Ellsberg's excellent "Classical and Current Notions of 'Measurable Utility,'" ECONOMIC JOURNAL, Vol. LXIV, September 1954.

[4] Indeed the theory is constructed to a large extent to pave the way for the analysis of the "mixed strategy" into which the player himself introduces elements of risk partly to cloud his opponent's foresight.

sets of axiom systems) that the person's preferences are so structured that a limited number of observations will reveal his ranking of all the other relevant alternatives.

More specifically, suppose we are given two lottery tickets, one of which offers the prize A with probability P (so that there is probability $(1 - P)$ of being subjected to the loser's penalty, B). Let the corresponding elements of the other lottery ticket be A', B' and P'. If this individual's mind works as required by the N–M axioms we should be able to predict correctly which of the lottery tickets he will prefer (choose) without having asked him his opinion of the two alternatives. Rather, as is shown in the Appendix, we need only inquire about his attitudes toward the prizes and penalties, A, B, A' and B', and even these need be *ranked* only against an arbitrarily chosen imaginary lottery ticket which is used as a standard of comparison. In fact, these assertions hardly require proof—we have assumed that the person's mind works in such a consistent predictable pattern.

Then where does the " cardinal utility measurement " enter this matter? The answer is that the word " cardinal " has been used, misleadingly, to mean two entirely different things. One denotation is the introspective absolute marginal pleasure measurement which I have heard one well-known game theorist indignantly call " metaphysics." The other, game theoretic, use of the word " cardinality " is entirely operational. The prediction as to which of the two lottery tickets will be chosen is most conveniently made with the aid of a numerical calculation. We are given the person's ranking of the prizes and intend to predict from these data which ticket he will choose. We want to find numbers (cardinal utility measures) which permit us to make this prediction.

The problem is like that of finding two pieces of cloth in a shop which together are large enough to cover our table at home. We wish to predict which two pieces will do this without having to take them home, try them and return them for exchange if they turn out to be too short. Numbers can help us here. We know that a table 3 yards long can easily be covered by two cloths whose lengths are $1\frac{1}{2}$ yards and $2\frac{1}{4}$ yards. Similarly, Neumann and Morgenstern have shown us how to find numbers which can help us to predict the person's ranking of the two lottery tickets. This clever device is essentially what is meant by their cardinal utility measure.

But note that this is not cardinal utility in the old-fashioned sense. Not a word has been said about successive increments of some item yielding diminishing (or increasing) marginal joy. Indeed, in the old-fashioned sense the N–M index is a sheep in wolf's clothing—it is nothing but an ordinal measure, after all! For it has been used to predict, but to predict only *rankings* of lottery tickets!

What specifically is meant, then, when N–M utility is called " cardinal "? This (and the equivalent assertion that the measurement is unique up to a linear transformation, or that it permits two degrees of freedom) refers only

to the predictive power of the index. This is best brought out by contrast with two less-powerful types of measurement scale.

The weakest type of index (one which conveys very little information) is one which serves only to *associate* items in two different collections. For example, persons in a newspaper group photograph are sometimes identified by placing a number next to each face and the same number beside the corresponding name in a list printed underneath. Here we set up the linguistic convention that any one man's name and face are given the same number. The numbers themselves do not matter and can be transformed in any way we like (we can exchange any number for another), provided no two faces bear the same number.

A ranking conveys somewhat more information, and in order to be able to transmit these data the numbers which measure them must be more circumscribed. To take the standard illustration, harder minerals are given higher numbers. The same information can be conveyed by any other set of numbers provided that we satisfy the linguistic convention that of two rocks the one with the higher number in the initial numbering also bears the higher subsequent number.[1] We say that the index which measures, or rather describes, a ranking is unique up to a monotone transformation.

Finally, we come to " cardinal measurement " which conveys still more information than did either of the other types of measure. It permits us, from what we know about two items in isolation, to *predict* something about them in combination. For example, our index of cloth length permitted us to predict whether two pieces of cloth of given lengths would cover a table whose dimensions are known without actually laying the pieces of cloth end to end. Here we have still less choice in the numbers which can convey the information. On the linguistic convention that we *add* lengths [2] the numbers which we assign to the lengths of any two pieces of cloth must add up to the number which we assign to the length they can cover together. This leaves us no more than two choices [3] (two degrees of freedom)

[1] Clearly other linguistic conventions might do—*softer* minerals might be given higher numbers.

[2] Here again we might use other conventions. Any process which uniquely assigns a third number to any two will do the trick. We might, for example, use logarithmic rulers with slide-rule scales and get used to multiplying lengths—10 in. and 5 in. = 50 in. But the point is that to convey information we must start off with some sort of language. We must first set up our linguistic conventions in any convenient way and then find the numbers which correctly convey the information in this language.

[3] Actually a length measure conveys even more information than this, and so we have only one choice in assigning numbers to lengths—we can only decide on a unit of length—whether we will measure in centimetres or in inches. The point is that in length we have a well defined zero. Mathematically, zero is defined as a number which when added to another leaves the latter unchanged. A non-existent piece of cloth (a piece of zero length) has an analogous (the mathematician calls it " isomorphic ") property. Hence in measuring length we have only one degree of freedom, the choice of unit of measurement, and a length measure is said to be unique up to a proportionate transformation. When measuring utility or temperature (without an absolute zero) we have two degrees of freedom—the choice of unit and the zero (freezing of water or some other point as in Fahrenheit measure), and hence these measures are said to be unique only up to a linear transformation.

in assigning these numbers. Once we call A " 3 yards " and B " 4 yards " we are forced to call A and B together " 7 yards," we are forced to call A and B and another piece like A " 10 yards " and so on. Similarly, in N–M utility measurement we want to assign to lottery-ticket prizes utility numbers which, when they are processed arithmetically in accord with the linguistic convention chosen,[1] will assign a utility number to the lottery ticket that ranks that lottery ticket correctly in relation to other possible tickets. And here again, once we pick such utility numbers for any two alternatives we are left no choice on the numbers to be assigned to other alternatives. This, then, is the sense in which the N–M utility measure is cardinal—it is richer in that it conveys more information than does an ordinary ranking obtained, for example, by directly asking any individual to state all his preferences. In effect, it is an economy device which requires an interviewer only to ask the subject to state *some* of his preferences—his ranking of lottery ticket prizes. With the aid of the N–M utility index (if it is applicable to this person) the interviewer can then *deduce* by himself the person's ranking of all other alternatives from the answers he has already received. But it must be emphasised that the N–M index still conveys information *only* about the individual's preference ordering.

But, it has been objected, the argument so far has only purported to indicate what its authors intended of the utility measure. Is it not possible that the index can do more, and measure marginal joy (or compare increments of satisfaction) as well? It is, after all, illegitimate to argue that Columbus failed to discover America by documenting his intention to find a new sea route to India.

Despite Professor Robertson's attempt to ascribe marginal subjective utility measurement powers to the index,[2] I shall argue that no such interpretation will do here. Such an interpretation must confuse marginal utility with another closely related concept, the marginal rate of substitution. We have long known that ordinal utility is perfectly compatible with the discovery of the *ratios* of the marginal utilities of two items (their marginal rate of substitution for one another). It is not the same to say that for me the marginal utility of apples is declining (a statement which to me has no operational meaning) and to say that I will offer successively smaller amounts

[1] The linguistic convention employed by Neumann and Morgenstern is that utilities can be added actuarially, *e.g.*, given a lottery ticket which promises a prize A with probability of $\frac{1}{4}$ and the alternative B with the probability of $\frac{3}{4}$, the ticket's utility will be evaluated at $\frac{1}{4}$ the utility of A plus $\frac{3}{4}$ the utility of B. In the appendix to this article I show when this convention can convey the information required of it, *i.e.*, numbers assigned in this way will rank lottery tickets correctly in accord with a person's preferences.

We can then say that the N–M index is cardinal in the mathematical sense that it yields numbers which can in turn meaningfully be multiplied by probability numbers and added. But this addition is meaningful just in *predicting rankings* correctly, which is all it is intended to do.

[2] See D. H. Robertson, " Utility and all What? " ECONOMIC JOURNAL, Vol. LXIV, December 1954, esp. pp. 671 and 674–5.

of money for additions to my stock of apples. It would be completely naïve to try to measure the subjective old-fashioned "cardinal" joy of apple possession in money terms because money itself is not calibrated in utility terms and its utility cannot be assumed constant.

But an attempt to interpret the N–M index as an old-fashioned cardinal measure is naïve in precisely this way. The N–M construction, instead of asking "how much more money for an additional apple?", validly takes as its behavioural criterion "How much higher must be the probability of winning some prespecified prize in order to compensate me for not receiving an additional apple?" In effect, it deals not with the marginal utility of (say) income, but with the ordinalist's substitute, the marginal rate of substitution between (the ratios of the marginal utilities of) income and the probability of winning the prespecified prize. As it should be, this is good cardinal measurement only in the game theorist's useful sense. Only if we are prepared to assume that we know the behaviour of the denominator of the *MRS*, the marginal subjective utility of an increase in the probability of winning,[1] can we go on to make deductions about the marginal *subjective* utility of apples from N–M index data.

In any event, the N–M theory and this assumption are totally irrelevant for one another. The N–M index can serve its purpose (prediction of the ranking of lottery tickets) perfectly well without any such premise. Contrariwise, while an assumption of constancy (or some other known pattern) of the subjective marginal utility of the probability of winning, P, can give us a neoclassical index of subjective marginal utility, it can do so without recourse to any of the N–M apparatus. We need only multiply the marginal rate of substitution of apples for P by the marginal utility of P to obtain a figure for the marginal utility of apples.

WILLIAM J. BAUMOL

Princeton University.

APPENDIX

The Neumann–Morgenstern Utility Measure

It may be worth deriving the statements on the N–M utility index which are made in the text, since no simple statement seems to be available in the literature.

[1] It may appear from the notation of the N–M index that this marginal utility is assumed to be constant. For, writing L for the standard lottery ticket, we have in the notation of the Appendix

$$U(L) = U[P : E, D] = PU(E) + (1 - P)U(D)$$

by the N–M linguistic convention (3), where $U(E)$ and $U(D)$ are the two constants whose choice is permitted by the index's two degrees of freedom. Hence the N–M marginal utility of P,

$$\frac{dU(L)}{dP} = U(E) - U(D) = \text{a constant}$$

In this theory there is, however, no reason to interpret the value of $dU(L)/dP$ as an index of the change in the individual's subjective pleasure. The constancy of $U(E) - U(D)$ is of no more significance than the use of a constant monetary unit—the dollar—when items are ranked in terms of money (which surely does not commit us to a belief in a constant subjective marginal utility of money).

First let us list a set of assumptions sufficient to assure predictability of the person's preferences:

To do this it is convenient to employ the following notation: For any alternatives A and B let $A \text{ I } B$ mean A is indifferent with B and for any alternatives A and B and any (probability) number P where $0 \leq P \leq 1$, let $[P : A, B]$ represent a lottery ticket which offers the probability P of obtaining prize A, and $1 - P$ of obtaining prize B. Using this notation, we may now list five assumptions about an individual's preference structure which suffice to assure that his preferences among lottery tickets will be predicted correctly by an N–M utility index:

Assumption 1. Transitivity: If for this person $A \text{ I } B$ and $B \text{ I } C$, then $A \text{ I } C$.

Assumption 2. Continuity of Preference as a Function of P: For any three outcomes E, A and D, if E is preferred to A and A is preferred to D, there exists a (probability) number P_a such that $0 < P_a < 1$ and $A \text{ I } [P_a : E, D]$.

Assumption 3. Independence: If $A \text{ I } B$ then $[P : A, C] \text{ I } [P : B, C]$ for any C and any probability P. This states that if two investments involve equal probabilities of attaining outcomes which are different but are in themselves equally valuable, the two investments will be equally attractive.

Assumption 4. For any alternatives E and D, and any probability numbers r and r', if E is preferred to D, then $[r : E, D]$ is preferred to $[r' : E, D]$, if and only if $r > r'$. This states that other things being equal, we will always prefer the investment opportunity with the greater probability of a favourable outcome.

Assumption 5. Compound Probability Arithmetic: For any alternatives E and D and any probability numbers P, P_a and P_b,

$$[P : [P_a : E, D], [P_b : E, D]] \text{ I } [r : E, D],$$

where r is a probability number given by $r = PP_a + (1 - P)P_b$. This requires some explanation. The first bracketed expression represents a compound lottery ticket which offers the probability P of winning. If the ticket holder wins, however, rather than a definite prize he obtains another lottery ticket $[P_a : E, D]$. If he loses, he is given, instead, the inferior lottery ticket $[P_b : E, D]$, with the same prizes but poorer odds. What is the probability of eventually coming out of all this with the grand prize, E? There is a probability P of winning the better lottery ticket which offers E with probability P_a, so the probability of getting E in this way is PP_a. However, if he loses the first draw, a loss which will occur with probability $(1 - P)$, the ticket holder still has the probability P_b of getting E, so that there is a probability $(1 - P)P_b$ of his obtaining E in this way. The total probability of obtaining E is then $PP_a + (1 - P)P_b$.

We may now interpret this last assumption to say that the person's psychology is such that he will evaluate a compound lottery ticket in terms of the probabilities of winning the ultimate prizes.

It has sometimes been asserted that " rational persons " will behave as these five assumptions require, but we need not get into this dispute here.

Let us now choose some lottery ticket to be used as a standard against which other alternatives can be evaluated. It is convenient (but not necessary) to assume that this ticket offers to the winner eternal bliss (E) and to the loser damnation (D), so that any alternative, A, which we bring to be evaluated against this standard ticket will presumably be no better than E and no worse than D.

By assumption 2, for any such A, there will be a probability number $P_a (0 < P_a < 1)$ such that $A \text{ I } [P_a : E, D]$. We can now prove the following

theorem: Given any two lottery tickets $[P : A, B]$ and $[P' : A', B']$ and a person whose preferences never violate assumptions 1–5, if we obtain (say by his introspection) the four probability numbers P_a, $P_{a'}$, P_b and $P_{b'}$ chosen so that

(1) $$A \text{ I } [P_a : E, D], \text{ and } B \text{ I } [P_b : E, D], \text{ etc.}$$

then from these numbers it is possible to predict which of the two lottery tickets will be preferred.

Proof: We begin by evaluating our first lottery ticket in terms of E and D.

$$[P : A, B] \text{ I } [P : [P_a : E, D], [P_b : E, D]] \quad \text{(by assumption 3)}$$

$$\therefore \quad [P : A, B] \text{ I } [r : E, D] \quad \text{(assumptions 1 and 5)}$$

where r is the probability number $PP_a + (1 - P)P_b$. Similarly, the second lottery ticket can be evaluated in terms of E and D as

$$[P' : A', B'] \text{ I } [r' : E, D] \text{ where } r' = P'P_{a'} + (1 - P')P_{b'}.$$

Therefore, by assumption 4, the individual must prefer $[P : A, B]$ to $[P' : A', B']$ if and only if

(2) $$r = PP_a + (1 - P)P_b > P'P_{a'} + (1 - P')P_{b'} = r',$$

and he will be indifferent between these tickets if and only if $r = r'$. But by hypothesis, P, P' are numbers given by the terms of the two lottery tickets, and P_a, P_b, $P_{a'}$ and $P_{b'}$ were found out by observing or questioning our individual. r and r' can then be evaluated directly and the higher of these two numbers must, by assumption 4, correspond to the preferred lottery ticket. Q.E.D.

Let us now see how the N–M index is constructed and prove that it can be used to predict correctly the choice of lottery ticket. As already indicated, we employ the following linguistic convention (definition) for evaluating the "utility" of a lottery ticket in terms of the utilities of its prizes:

(3) $$U[P : A, B] = PU(A) + (1 - P)U(B)$$

That is, if $P = \frac{3}{4}$ so that the odds of winning are 3 to 1, then we evaluate the utility of the lottery ticket at $\frac{3}{4}$ the utility of victory plus $\frac{1}{4}$ the utility of defeat. But we note that this is only a convention. To show that it is usable we must first indicate how these utility numbers can be found and then we must prove that they must always assign a higher utility number to the preferred lottery ticket.

To see how the utility of any alternative, A, can be found we first assign arbitrary "utility" numbers

(4) $$U(E) > U(D)$$

to eternal bliss (E) and damnation (D) in our standard lottery ticket. Now we can find $U(A)$ by recalling (1) and defining

(5) $$U(A) = U[P_a : E, D], \; U(B) = U[P_b : E, D], \text{ etc.}$$

so that by (3)

$$U(A) = P_aU(E) + (1 - P_a)U(D), \text{ etc.}$$

Hence by finding P_a in (1) the utility number $U(A)$ can be computed.

Finally, I give a proof of the statement that these utility numbers rank lottery tickets correctly so that $U[P : A, B] > U[P' : A', B']$ if and only if the former is the preferred lottery ticket, *i.e.*, if and only if (2) holds.[1]

[1] The proof can easily be extended to the case of indifference.

Proof: The utility of the first lottery ticket is

$$U[P:A,B] = PU(A) + (1-P)\,U(B) \qquad \text{(by convention (3))}$$
$$= PU[P_a:E,D] + (1-P)U[P_b:E,D] \qquad \text{(by (1) and (5))}$$
$$= P\{P_aU(E) + (1-P_a)U(D)\} + (1-P)\{P_bU(E) + (1-P_b)U(D)\} \qquad \text{(by (3))};$$

which, multiplying out and rearranging terms

$$= \{PP_a + (1-P)P_b\}U(E) + \{P(1-P_a) + (1-P)(1-P_b)\}U(D)$$
$$= \{PP_a + (1-P)P_b\}U(E) + \{1 - PP_a - (1-P)P_b\}U(D)$$
$$= rU(E) + (1-r)U(D) \qquad (6)$$

Similarly the utility of the second lottery ticket is

$$U[P':A',B'] = r'U(E) + (1-r')U(D) \qquad (7)$$

Thus comparing (6) and (7) we see that since by (4) $U(E) > U(D)$, the first lottery ticket will have the higher utility number if and only if $r > r'$. But we have just seen (2) that this condition also guarantees that that lottery ticket will be preferred. Thus we have proved that convention (3) will always assign a higher utility number to the preferred lottery ticket as we require.

ALFRED MARSHALL AND THE COMPETITIVE FIRM[1]

SINCE Marshall's death, his Representative Firm has been widely studied and frequently criticised.[2] Less attention has been devoted to the individual firms which make up the competitive industry, and whose characteristics largely determine the character of the Representative Firm itself. This relative lack of interest in Marshall's competitive firm is perhaps partly explained by the fact that he never put forward a clear and concise theory of the individual business. As Triffin says, " Marshall's occasional remarks about the firm's behaviour are nowhere integrated into the main trend of an analysis, narrowly clustered around 'industrial' concepts." [3] And Samuelson comments on " the paradox that Marshall with whom the doctrines of partial equilibrium and industry analysis are inseparably associated, nowhere presents a complete or satisfactory theory of the industry in its relationship to the firms which make it up." [4]

Despite this apparent reluctance to present his views on the firm in the shape of a comprehensive theory, there is no lack of hints as to what these views were. Schumpeter has pointed out that Marshall assembled " practically all the bricks and all the mortar required for the theory of the individual firm," [5] thereby anticipating many features of more recent analyses. He also suggests that " the later theory of imperfect competition may fairly be traced to him. Though he did not elaborate it, he saw the phenomenon more clearly than most of those who did. In particular, he did not exaggerate its importance." [6] Nor was Marshall merely an abstract theoriser; he tried hard to ensure that his theory gave a realistic picture of the industrial scene in his day.

In these circumstances it seems unfortunate that more attempts have not been made to clear up the obscure parts of Marshall's discussions of the firm and industry. Among his interpreters, Mr. Shove, in the 1930 Symposium, gave perhaps the most comprehensive and accurate commentary on Marshall's views, pointing to the emphasis on the limited life of the individual firm and on market imperfections. Sir Dennis Robertson also closed his

[1] I am greatly indebted to Sir Dennis Robertson for his comments and criticisms, as also to my colleagues Professor G. C. Allen, Dr. Marian Bowley and Dr. Alfred Stonier.

[2] See especially, P. Sraffa, "The Laws of Returns under Competitive Conditions," ECONOMIC JOURNAL, 1926, p. 535; Lionel Robbins, "The Representative Firm," ECONOMIC JOURNAL, 1928, p. 387; A Symposium on " Increasing Returns and the Representative Firm," ECONOMIC JOURNAL, 1930, p. 79; " Alfred Marshall's Theory of Value," Ragnar Frisch, *Quarterly Journal of Economics*, 1950, p. 495; J. N. Wolfe, " The Representative Firm," ECONOMIC JOURNAL, 1954, p. 337; Sir Dennis Robertson, *Economic Commentaries* (London, 1956), especially pp. 12–25.

[3] *Monopolistic Competition and General Equilibrium Theory*, p. 8.

[4] *The Foundations of Economic Analysis*, p. 207.

[5] J. A. Schumpeter, *History of Economic Analysis*, p. 997 n.

[6] *Capitalism, Socialism and Democracy*, p. 78 n.

contribution to the 1930 Symposium by stressing the importance which Marshall attached to the relatively short life of the individual firm. In his more recent contribution Sir Dennis has re-emphasised this point, as well as bringing out the fact that Marshall explicity allowed for the existence of imperfect competition. The present paper accepts this general line of argument as the basis for a rather fuller account of Marshall's views on the individual competitive firm.

Two main strands of thought have to be considered. First, Marshall was concerned, at any rate by implication, to analyse all the various types of market form with which the competitive firm might be faced. Second, he brought in several dynamic qualifications to the argument, namely, expectations, and the forces of growth and change.

We begin with an important general question, namely, the way in which Marshall's thought developed. Professor Robbins has made much of the fact that both the Representative Firm and also most of the discussion on increasing returns, which was later to lead to such controversy, did not appear at all in the First Edition of the *Principles*, published in 1890; they were added a year later, in the Second Edition. Professor Robbins rightly concludes that the introduction of the Representative Firm at this stage was " the result of the changes in the parts of Book V dealing with the notion of increasing returns under competitive conditions." [1] It is, however, perhaps a little unfair to brand it, as he does, " an afterthought." [2] It is perfectly true that the concept did not appear at all in the First Edition of the *Principles*, though the idea of the life cycle of the firm did, in much the same form as it now occurs on pp. 314–17 of the *Principles*. Marshall was already emphasising the fact that when output rose the extra production was likely to come from a firm just struggling into business and whose cost conditions were not typical. The problem whether decreasing costs were compatible with competitive equilibrium—the problem which the Representative Firm was intended to solve—had already been troubling Marshall for some years. Nor was his difficulty caused by the attacks of any critic; he had lighted on it himself, at an early stage, in his reading of Cournot.

> " You say that, *à propos* of Increasing Returns, you are inclining to lay stress on the incomplete utilisation of existing productive facilities. That is of course one of my chief hobbies. My confidence in Cournot as an *economist* was shaken when I found that his mathematics *re* I.R. led inevitably to things which do not exist and have no near relation to reality." [3]

[1] *Op. cit.*, p. 388 n. [2] *Ibid.*, p. 387.

[3] This must refer to the criticism, voiced by Marshall in the *Principles*, that some economists " among whom Cournot himself is to be counted, have before them what is in effect the supply schedule of an individual firm; representing that an increase in its output gives it command over so great internal economies as much to diminish its expenses of production; and that they follow their mathematics boldly, but apparently without noticing that their premises lead inevitably to the conclusion that, whatever firm first gets a good start will obtain a monopoly of the whole business of its trade in its district " (*Principles*, p. 459 n.).

> "One of the chief purposes of my Wanderjahre among factories, etc., was to discover how Cournot's premises were wrong. The chief outcome of my work in this direction, which occupied me a good deal between 1870 and 1890, is in the 'Representative Firm' theory . . . as well as the parts that directly relate to supply price for I.R." [1]

This, of course, merely serves to heighten the mystery about the Representative Firm. Had Marshall already invented it by 1890? Or had he studied the problems of increasing returns without it? On the other hand, it becomes clear that Marshall himself was quite as aware of the apparent contradiction between increasing returns and competitive equilibrium as were his later critics. It also follows that the explanation of this contradiction which he put forward in the Second Edition of the *Principles* was deliberately and specifically designed in an endeavour to prove that there was *no* contradiction between competitive equilibrium and increasing returns within the individual firm. Is it possible that the reason why Marshall left this somewhat arid and intricate discussion out of the First Edition was his perpetual fear of making the discussion too difficult to give him that audience among business-men which he so much desired?

With the publication of the Second Edition in 1891, all the main threads in Marshall's theory of the firm had now seen the light of day, though there were some changes in the relevant sections of the *Principles* in later editions. For example, in the Fourth Edition (1898), though there was no major change of substance, considerable sections of the text were moved into other chapters or into footnotes. After 1898 there were two major changes. As we shall see in more detail later, the passage on the "trees in the forest" was altered in the Sixth Edition (1910) to allow for the growing importance of joint-stock firms. The important Appendix H grew gradually from a footnote to Chapter 5 of Book V in the First Edition to reach almost its present form by the Fourth Edition, as a "Note on the Pure Theory of Stable and Unstable Equilibria." It took its final shape in the Fifth Edition (1907) with the addition of the present first section.

However, while these changes are both interesting and important, the fact remains that Marshall's scheme of thought was virtually complete by 1890, which, in turn, implies that his views on competitive business were largely determined by the impressions he had gathered of British industry in the 1870s and 1880s during his visits to firms. This helps to explain the small part played by joint-stock firms in his theory, and also his considerable emphasis on producers' fears of "spoiling the market," which must have struck him during so depressed a period as the 1870s and 1880s. Perhaps, too, his discovery of the existence of excess capacity owed something to the prevailing depression.

Many of the changes which Marshall made in the various editions of the *Principles* will be noted as we proceed. For simplicity, page references

[1] From a letter to A. W. Flux, dated March 7, 1898. *Memorials of Alfred Marshall*, pp. 406–7.

are embodied in the text and, unless otherwise stated, these are to the Eighth Edition of the *Principles* before the reprint of 1950 which (most regrettably) altered the pagination.

I

The first main section of this paper considers the markets faced by Marshall's competitive firm. Marshall gave no full or tidy classification of market forms, and *obiter dicta* about them are well scattered in both the *Principles* and *Industry and Trade*. There is much to be said for consulting *Industry and Trade*, where Marshall summarises the main features of his theoretical scheme within the compass of a single, short chapter (Book II, Chapter 1). The terms competition and monopoly are used in the present-day fashion, it being stressed that " they shade into each other by imperceptible degrees " (*I. & T.*, p. 178). Marshall's classification of markets is not very explicitly related to this distinction; he writes of " open " and " monopolistic " markets. The term " open " market seems to cover all those markets where there is a number of competing firms, but where oligopolistic interdependence in price–output policy is ruled out.

Even so, numerous types of " open " markets are possible, each shading into each other, and each of these has its place in the *Principles*. For the usual pedagogic reason, Marshall begins with the simplest case, and proceeds to more complicated ones. The first discussion of pricing in a competitive industry (Book V, Chapter 3) occurs during a study of " The equilibrium of normal demand and normal supply," and the conditions assumed are those of pure competition. It is postulated that " there is much free competition;[1] that is, buyers generally compete freely with buyers and sellers compete freely with sellers " (p. 341). With these assumptions, Marshall found it possible to postulate that " there is only one price in the market at one and the same time " (pp. 341–2). This result is possible because, " although everyone acts for himself, his knowledge of what others are doing is supposed to be generally sufficient to prevent him from taking a lower or paying a higher price than others are doing " (p. 341).

Marshall makes it clear that these assumptions are only intended to be provisional; normal demand and supply are being studied " in their most general form " and consequently " we are neglecting those features which are special to particular parts of economic science, and are confining our attention to those broad relations which are common to nearly the whole of it " (p. 341).[2] These relatively simple assumptions suffice throughout the preliminary discussion of equilibrium (Book V, Chapter 3), and for most

[1] In the first four editions of the *Principles* the word " much " did not occur, and the words *free competition* were italicised.

[2] Marshall also says, from the First Edition onwards, " We have already inquired to some extent, and we shall have to inquire further, how far these assumptions are in accordance with the actual facts of life "; but it is never made clear whether, and if so where, this further inquiry takes place.

of the discussion of long- and short-period supply conditions as illustrated by reference to the fishing industry (Book V, Chapter 5). Since he is concentrating attention on the response of supply, over time, to a once-for-all change in demand, Marshall makes demand conditions as simple as possible by considering a relatively homogeneous product like fish, and by implying that the market is near-perfect.

When he considers manufactured goods, however, a subtle difference creeps in. It is suggested that such products can also be homogeneous, at least where the goods are "so simple and uniform that they can be sold wholesale in vast quantitites" (p. 286). Besides most "raw produce" such homogeneous goods include some "plain and common" manufactured goods like "steel rails" and "calico" (p. 286). The difference between agricultural and manufactured goods sold in "large and open" markets, then, need not be in any lack of homegeneity in the products. The difference is that, with manufactured products, the producers, even of homogeneous goods sold in Marshall's "large and open" market, can often exert some influence on each others' price policy. This new factor comes out clearly when, towards the end of Chapter 5, Marshall turns the discussion, by implication, from fish to manufactured goods and studies the effect on supply price "of the expectation of a low price" (p. 374). He explains that if, in a slump, "producers had no fear of spoiling their markets, it would be worth their while to produce for a time for any price that covered the prime costs of production and rewarded them for their own trouble" (p. 374). In practice, however, they do not do this, but stop producing altogether as soon as the price reaches a level "which is nearly always above, and generally very much above the special or prime cost for raw materials, labour and wear-and-tear of plant, which is immediately and directly involved" (pp. 374–5).

This must mean that Marshall's "large and open" market for manufactured goods does not contain enough firms to experience pure competition. Even in the "large and open" market, a producer can incur the "resentment" and "odium" of other producers if he sells too far below "full cost" in a depression. One is surely justified in supposing that the guilty producer could not be singled out for such treatment unless the number of firms in the industry were smaller than perfect competition would require. On the other hand, the producer is apparently more worried by the personal criticisms of others than by any economic actions on their part. As Sir Dennis Robertson has put it: "It seems to be not so much of their trade policy that Marshall's typical [1] producer moves in fear, as of their personal behaviour to him (and no doubt to his wife) when he meets them outside the chapel or in the club." [2] An additional reason for supposing

[1] I take it that the intention here is, rightly, to imply that Marshall's "typical" producer operates in conditions of monopolistic competition.

[2] *Economic Commentaries*, p. 15.

that the number of firms in the " large and open " market for manufactured goods will not be very big is that it is small enough to allow " formal or informal agreement with other producers to suspend production for fear of further spoiling the market " (p. 374).

Here, then, we are concerned with monopolistic competition which occurs, not because products are heterogeneous, but because the number of producers is less than in perfect competition. I can, however, see no reason for supposing that the number of firms concerned is small enough to give rise to oligopoly in the strict sense of *really* few sellers; as we shall see later, Marshall rules out this type of oligopoly from the analysis of the *Principles*. There is, however, a hint of oligopoly in the sense that, despite the large number of firms, each seller does consider the effects of his action on his rivals. Sir Dennis Robertson has written, " It is not so clear to my mind whether the theory necessarily implies an element of oligopoly, in the sense in which that ugly word is now used to denote (whatever the numbers involved) a regard by the producer for the effect of his actions on the price or output policy of his competitors." [1]

A second type of situation which Marshall seems to have in mind in this discussion of " spoiling the market " is more complex: he speaks of the producer's " own customers." In other words, we are now concerned with monopolistic competition based on product differentiation, either through physical differences in the product, through the " goodwill " of the individual producer or through transport costs and other geographical factors. It is true that, in the passage just quoted, Sir Dennis does not mention this distinction, but it seems valid, and, in correspondence between us, Sir Dennis has accepted it. Let me quote Marshall's own words more fully. " Each man fears to spoil his chance of getting a better price later on from his own customers; *or*, if he produces for a large and open market he is more or less in fear of incurring the resentment of other producers, should he sell needlessly at a price that spoils the common market for all " (p. 374; my italics). It is surely not going too far to see in that word, " or," the implication that Marshall is here concerned with two different situations, in one of which the individual firm has its " own " customers, and in the other of which it sells in a large " common " market.

Whatever the truth on this particular point, Marshall certainly did draw a specific distinction between " general " and " special " markets. The goods sold in these latter markets are, in his terminology, specialities. To quote Shove: " the goods made by each firm are slightly different from each other—substitutes but not perfect substitutes." [2] Marshall gives several reasons why such goods have a limited market (p. 287). Some " aim at creating a new want, or at meeting an old want in a new way." Some are " adapted to special tastes," and for that reason cannot have " a

[1] *Economic Commentaries*, p. 15.
[2] Shove, *op. cit.*, p. 106.

very large market." Others "have merits that are not easily tested, and must win their way to general favour slowly."

Marshall does not give specific instances of these goods, when he is discussing the special market, apart from a mention of "the Regent Street shoemaker" (p. 458 n.). Elsewhere, however, in a discussion of increasing returns (p. 392 n.), he mentions particular brands of sewing-machines and electric-light bulbs as being more or less imperfect substitutes for each other.[1] The reasons given for this lack of homogeneity are that—

> "in these cases the things do not really satisfy the same wants, they appeal to slightly different needs or tastes; there is still some difference of opinion as to their relative merits; or else perhaps some of them are patented or in some other way have become the monopoly of particular firms. In such cases, custom and the force of advertising may keep rivals in the field for a long time; particularly if the producers of those things which are really the best in proportion to their expenses of production are not able effectively to advertise and push their wares by travellers and other agencies" (p. 391 n.).

Although he thus distinguished between the general market served by a number of producers and the special market in which the individual firm had its "own" customers, Marshall never tried to state the relationship between such "general" and "special" markets explicitly; perhaps he never intended that it should be so stated. Nevertheless, the matter is so central that some attempt at fuller explanation seems essential.

The main difficulty is that Marshall seems to have used the terms to cover two different situations:

> (*a*) where the general market is the sum total of all the special markets of the firms in the industry, and
>
> (*b*) where the general market in which all firms compete is completely distinct from the special markets of all these individual firms. For example, market gardeners may each have their own local markets, but also supply a general market at Covent Garden.

The following quotations are those where Marshall seems to be considering case (*a*):

> With "manufactures, which are adapted to special tastes, [every firm] is likely to be confirmed[2] more or less to its own particular market; and, if it is so confined, any hasty increase in its production is likely to lower the demand price in that market out of all proportion to the increased economies that it will gain; even though its production is but small relatively to the broad general market for which in a more general sense it may be said to produce" (pp. 457–8).
>
> "This may be expressed by saying that when we are considering an

[1] In the first three editions of the *Principles* this discussion was part of the text; it became a footnote in the Fourth Edition (1898).

[2] Earlier editions of the *Principles* show that this is a misprint for confined.

> individual producer we must couple his supply curve—not with the general demand curve for his commodity in a wide market, but with the particular demand curve of his own special market. And this particular demand curve will be very steep; perhaps as steep as his own supply curve is likely to be,[1] even when an increased output will give him an important increase of internal economies" (p. 458 n.).

This seems to lead to the conclusion that the general market is the sum total of all the special markets, a conclusion which is strengthened by the fact that Marshall seems to imply that "the relations between the individual producer and his special market" add up to "those between the whole body of producers and the general market" (p. 459).

Marshall seems, then, to have been concerned mainly (perhaps solely) with case (*a*) in the *Principles*, from which all the above quotations are taken. In *Industry and Trade*, however, he is concerned with case (*b*).

> "Everyone buys, and nearly every producer sells, to some extent in a '*general*' market, in which he is on about the same footing with others around him. But nearly everyone has also some '*particular*' markets: that is, some people or groups of people with whom he is in somewhat close touch: mutual knowledge and trust lead him to approach them, and them to approach him, in preference to strangers" (*I. & T.*, p. 182).

If this interpretation is correct, Marshall changed his emphasis between the *Principles* and *Industry and Trade*. Since we are here mainly concerned with the views on the individual firm which Marshall put forward in the *Principles*, it is on case (*a*) that we concentrate.

Can one produce a reasonable interpretation of case (*a*)? The general market is here made up entirely of buyers who normally patronise a particular seller, though presumably Marshall would have been the last to deny that there would be a perpetual but marginal movement of clients from one firm to another. The demand curve for this broad, general market will be given by the lateral addition of the particular demand curves of all the individual special markets. This assumes, of course (*pace* Mr. Sraffa), that the products of all the various firms are nearly enough homogeneous to permit one to regard them as different varieties of the same broad commodity. So, for example, if all the demand curves of all the individual special markets displayed the same elasticity at every price, the general market would also exhibit that same elasticity.

The general demand curve is here assumed to be drawn up on the usual Marshallian assumption, namely, that each firm in the industry charges the same price as each other firm; in other words, this demand curve is the same as Chamberlin's *DD'* market curve. But it is also possible for each individual producer to postulate the existence of a curve like Chamberlin's

[1] In the Second Edition, this reads, "And this particular demand curve will generally be very steep, steeper than his own supply curve is likely to be."

subjective *dd'* curve, showing how much the individual producer would sell, at various prices, if he were to raise or lower *his* price but all other producers held their prices constant. This *dd'* curve would have a higher elasticity of demand than *either* the individual producer's "particular" demand curve *or* the "general" demand curve for the broad market. The individual firm, being small by comparison with the whole market, could on these assumptions hope to attract a few customers from each of its rivals relatively easily; in other words, it could expand its output considerably without having to lower its prices very far *if* other producers held their prices constant.

However, only in abnormal circumstances, such as a slump, does Marshall envisage firms selling in their rivals' markets on any scale. Moreover, he stresses the difficulty of selling outside one's own special market, where "goodwill" is considerable. Only "when trade is slack" will a producer "try to sell some of his surplus goods outside his own particular market," and he will have to do so "at prices that do little more than cover their prime costs" (p. 458).

So, even if he could assume that all his rivals' prices remained unchanged, an individual price-cutter would gain little. He might be able to obtain higher prices outside his own special market than he could hope to obtain within it, for any given expansion of sales; yet he would find the marginal costs of selling outside his own market much higher. It is these high selling (including transport) costs which are the main factor confining firms within their own special markets, at any rate in the short run. In a sense, all this is very pedestrian, and it may be unwise to try to interpret Marshall so explicitly, but it seems important to spell out this relationship between the general and special market.

It is not certain whether Marshall intended the assumption of a single price, ruling throughout the market, with which he begins in Book V, Chapter 3, to hold more generally throughout the *Principles*, though in *Industry and Trade* he is more explicit. "A producer, a wholesale dealer or a shopkeeper, who has built up a strong connection among the purchasers of his goods has a valuable property. He does not generally expect to get better prices from his clients than from others. But he expects to sell easily to them because they know and trust him" (*I. & T.*, p. 182).

Nevertheless, even here, there are the usual Marshallian exceptions. The suggestion is that, in his own particular market, a producer "does not sell at low prices in order to call attention to his business, as he often does in a market where he is little known" (*I. & T.*, p. 182). On another occasion, in the *Principles*, he writes of 'a few special bargains . . . made at lower prices without much affecting the general market" (p. 375). Despite these qualifications, however, it seems that Marshall did intend to imply that there was a single price, ruling broadly throughout the general market of each industry. And even these exceptions may be more apparent

than real; many of them will represent price reductions which can quite legitimately be looked upon as creating an alternative weapon to the selling costs which have to be incurred by a producer in bringing his goods to the notice of potential customers.

On reflection, however, it becomes apparent that we here face a serious dilemma. If all the special markets of the individual firms were clearly separate there would be little competition in the industry; the producers would be monopolists and not competitors. Consequently, prices would tend to differ from firm to firm and, even if they did not, the whole concept of an industry would be in danger of breaking down. This is precisely Triffin's criticism of later theories of monopolistic competition; it is also a point which Sraffa stressed in his 1926 article. Commenting on Marshall's suggestion that where products are heterogeneous one should couple the producer's supply curve, not with the general demand curve, but with his own particular demand curve, Sraffa wrote, " It is clear that such particular curves can by no means be compounded so as to form a single pair of collective demand and supply curves."[1] Indeed, he went on to conclude that even the smallest degree of heterogeneity of product would lead to a position where each producer behaved like a monopolist.

On the other hand, it will not help to assume that firms can compete easily in each others' special markets. Quite apart from making nonsense of the whole concept of the special market, this would lead to one of the very results which that concept was intended to avoid. The individual firm would be able, where increasing returns were being experienced, to monopolise the whole market; increasing returns and competitive equilibrium would be irreconcilable. It follows that Marshall is here walking a logical tightrope. The analysis may well lead either to Mr. Sraffa's situation, where every firm is a monopolist, or, alternatively, it may be necessary to concede that increasing returns and competitive equilibrium are *not* compatible.

There is no sign that Marshall ever posed this dilemma quite so explicitly; though there is equally no sign that he deliberately dodged doing so. He would surely have tried at least to walk the " tightrope." Perhaps the most significant evidence in favour of this view is that, on pp. 460–1 of the *Principles*, immediately after the discussion of special and general markets, Marshall proceeds to discuss the drawing up of the industry's supply curve. He cannot have been entirely oblivious of the objections to such a procedure, where the products of the industry were heterogeneous, and the fact that he thought it legitimate to construct this supply curve suggests that the degree of heterogeneity he was postulating was not great. (Was this one of the things which Schumpeter had in mind when he said that Marshall " did not exaggerate " the importance of monopolistic competition?). This view is strengthened by the fact that in *Industry and Trade* Marshall includes both

[1] *Op. cit.*, p. 546.

"general" and "particular" markets within the classification of "open" markets. It is true that in the *Principles* there is the distinction between "special" markets and "large and open" markets; is it over-interpreting Marshall to suggest that whilst in the "special" market the element of "largeness" had disappeared, the quality of "openness" remained? Or, to be more precise, while the "special" market must lie near the borderline between competition and monoply, it always lies on the competitive side of that borderline?

On the other hand, Marshall gives reasons for supposing that the fear of cut-throat competition in times of slump will be especially great in an industry where there are many special markets; though he is most explicit in the early editions of the *Principles*. When each firm has to acquire a market of its own, this increases "fears of spoiling his own particular market, or incurring odium from other producers for spoiling the common market" (Second Edition, p. 489). It seems to follow that there may be some justification for Mr. Sraffa's suggestion that "the forces which impel producers to raise prices" are, in this kind of situation, "much more effective than those which impel them to reduce them."[1] However unwilling we may be to go all the way with Mr. Sraffa in concluding that a monopolistic situation is the only logical result, it is clear, not only that the dilemma is far from being solved in the *Principles*, but also that Marshall's room for manœuvre is very small indeed.

In the *Principles*, then, Marshall not only considers perfect competition, but also monopolistic competition—both with and without product differentiation. But what of oligopoly? Oligopoly does not fit easily into Marshall's classification; with the qualification mentioned above,[2] he specifically rules it out from the *Principles* because it is incompatible with his scheme of analysis.

"Those manifestations of nature which occur most frequently, and are so orderly that they can be closely watched and narrowly studied, are the basis of economic as of most other scientific work; while those which are spasmodic, infrequent and difficult of observation, are commonly reserved for special examination at a later stage" (Preface, p. xiii). This, he explained, was the reason for his decision to leave over "the study of large businesses" until *Industry and Trade*.

> "When any branch of industry offers an open field for new firms which rise to the first rank, and perhaps after a time decay, the normal cost of production in it can be estimated with reference to 'a representative firm' . . . a study of such a firm belongs properly to a volume on Foundations. So does a study of the principles on which a firmly established monopoly, in the hands of a Government department or a large railway, regulates its prices with main reference indeed to its own revenue; but also with more or less consideration for the wellbeing of its customers.

[1] *Op. cit.*, p. 548.

[2] See p. 678.

> " But normal action falls into the background, when Trusts are striving for the mastery of a large market, when communities of interest are being made and unmade. . . . Such matters cannot be fitly discussed in a volume on Foundations: they belong to a volume dealing with some part of the Superstructure " (Preface, p. xiii).

Or again, writing of situations where, because of increasing returns, the production of a commodity " is apt to fall almost entirely into the hands of a few large firms," Marshall suggests that the " production of such a commodity really partakes in a great measure of the nature of a monopoly; and its price is likely to be so much influenced by the incidents of the campaign between rival producers, each struggling for an extension of territory, as scarcely to have a true normal level " (p. 397).

Since his analysis did not claim to deal with such industries, Marshall must have viewed their growth with some misgivings. In *Industry and Trade* he considered this point. He began by stressing the relative smallness of private firms in the late nineteenth century.

> " Under these conditions, a very large capital in the aggregate was distributed over many firms of moderate size, each with its own individual life, and its own personal relations with employees. If any firm became slack in enterprise or weak in purpose it passed away and made room for others. . . .
>
> " But in the new age joint stock control has become universal in regard to railroads; and it has become general even in regard to manufacturing and other industries which have an urgent need for alert and versatile administration " (*I. & T.*, p. 315).

Marshall goes on to explain that since these industries are subject to increasing returns, a firm could build up a monopoly position " provided its own vigour remained unimpaired." Then comes what seems to be a significant sentence. " In old times there was often much difficulty on this score; but that has diminished greatly during the last three or four generations " (*I. & T.*, p. 315). Nor is this all; a little later, Marshall writes:

> " It is not possible to say how far this position is changed by the expansion of joint stock companies with a potentially perpetual life; but every recent decade has contained some episodes which suggest that it may probably be greatly changed, either in substance, or in the methods by which new life is brought into old bodies.
>
> " A private firm without great vigour is sure to die; a large joint stock company has special advantages, many of which do not materially dwindle with age . . . it has special opportunities for the introduction of new blood into its management " (*I. & T.*, pp. 315–16).

This seems to represent a significant change in Marshall's view of the joint-stock company as compared with that which appeared in the *Principles*. On the other hand, in the first section of Appendix H, which was added in 1907, Marshall suggested that perhaps, after all, his analysis was not so seriously affected by the existence of oligopoly as one might have supposed.

He was not certain that the oligopolistic group " must be regarded as *prima facie* a monopoly," and could not be analysed in terms of " normal behaviour," for " the last years of the nineteenth century and the early years of this have shown that even in such cases competition has a much greater force, and the use of the term ' normal ' is less inappropriate than seemed probable *a priori* " (p. 805). The analysis of the *Principles*, he thought, was perhaps capable of adjustment to deal with the problems of oligopoly. But the study of oligopoly in the strict sense of really small numbers of leading firms is explicitly ruled out from the book as it stands. Marshall's competitive firm is one with a sufficiently large number of rivals for any oligopolistic " circularity " in price policy to be ruled out.

II

We turn now from market forms to the dynamic qualifications through which Marshall tried to bring realism into an otherwise static analysis. The stress laid by Mr. Shove and Sir Dennis Robertson on Marshall's way of treating the relatively short life of the individual firm shows that this is something which must be studied in detail. But there are other dynamic factors too. So far as Marshall's short-period analysis is concerned, there is only one dynamic qualification—expectations. These come into the analysis in the form of the entrepreneurs' fears of " spoiling " either their own special markets or the common, general market In both cases the fear is that an " immoderate " policy now will " spoil his chances of getting a better price later on " (p. 374). If producers " glut the market " they " tend to prevent prices from reviving " (p. 375). This qualification apart, Marshall's short-run analysis of the firm is static. But it seems more sensible to regard this fear of " spoiling the market " as a qualification to a single, unitary theory, rather than to adopt Frisch's procedure of suggesting that the firm is a " quantity adapter " when times are good and a " price adapter " when they are bad. One is thereby spared the difficulties inherent in " Frisch's dichotomy." [1]

While his short-run theory is basically static, Marshall's long-run analysis is greatly modified by the dynamic qualifications of growth and change. Marshall seems to use the term long-run in two senses. The first, and best known, defines it as the period of time within which substantial changes to fixed plant can be made. But there is also the implication of a long run on the demand side. Although Marshall finds it possible to study the reactions of supply to once-for-all change in demand conditions because, " those demands which show high elasticity in the long run show a high elasticity almost at once " (p. 456), he also allows for the fact that " a long or short time may be required for developing the new and extended uses of the commodity " (p. 456). Again, " the increase in consumption arising from a

[1] Robertson, *op. cit.*, p. 14.

fall in price is gradual" (p. 807). It follows that whether or not there is also a process of gradual growth affecting the whole economy—which there will be—the firm will have to wait some time before it reaps the full benefit of a reduction in its prices. This means that even if a firm is producing in conditions of increasing returns it may not be able to extend its sales very quickly. The stress is always on "gradual growth" (p. 501); we should "expect a gradual increase in demand to increase gradually the size and efficiency of this representative firm" (p. 460). It is this kind of discussion presumably which Mr. Guillebaud has in mind when he regards Marshall as sometimes using the term long period to stand "conceptually for the Never-never land of unrealized tendency." [1]

So much for growth; what of the forces of change? There are hints that Marshall, like Schumpeter after him, put some reliance on competition from new firms and new products to ensure that, even in monopoly, competitive elements were not wholly absent. For example, he suggests that the most a firm producing in conditions of increasing returns can hope for is "monopoly limited by the consideration that a very high price would bring rival producers into the field" (p. 286). This is "potential competition" in the modern sense. In the long run, this potential competition may become actual; "time is on the side of the more economic methods of production; his distant competitors will gradually get a stronger footing in the place, unless he or some new man adopts improved methods" (p. 398). But perhaps the best instance of such a passage, one indeed that is almost pure Schumpeter, is in *Industry and Trade*.

> "The ownership of exclusive facilities for production or trade in the modern world does not always suggest to a man of sound judgment that he should pursue a severely monopolistic price policy. On the contrary, he will keep a watchful eye on the sources of possible competition, direct or indirect. If it appears that those sources are likely to prove large and strong, and that the pace at which competitive supply runs is likely to become considerable before long: then he will not make full use of his power, but will adjust his prices to obtaining a firm hold on the market before he can be caught by competitive supply 'following quickly at his heels'" (*I. & T.*, pp. 396–7).

This leads to the final, and most important, of the dynamic elements in Marshall's theory of the firm—again a factor of change. This we may call, though Marshall himself did not, the "life cycle" of the firm. The concept was introduced partly in a endeavour to give a realistic picture of the nineteenth-century industry and partly to help to show how there could be competitive equilibrium under increasing returns. We have seen that when Marshall brought in market imperfections to help resolve the dilemma these led to problems of their own by raising doubts as to whether the solution really was a competitive one. But while this question is important, it does

[1] Cf. Robertson, *op. cit.*, p. 16.

not seriously affect Marshall's own solution. For he put the main burden in solving it on one of his favourite biological concepts—the life cycle of the firm.

Marshall insisted that the efficiency of the private firm was a function of its age and of that of its founder. By this he justified himself in suggesting that there were many industries where it was virtually impossible for the individual firm to become a monopolist. The firm would start life as a struggling new entrant, but, provided it survived, it would grow. Indeed, the "new man" might go far, working his way into an established industry by his "energy and flexibility" (p. 285) and progressively increasing his output and strength. "And it is true that, if, as his business increased, his faculties adapted themselves to his larger sphere, as they had to his smaller; if he retained his originality, and versatility and power of initiation, his perseverance, his tact and his good luck for very many years together;[1] he might then gather into his hands the whole volume of production in his branch of his trade for his district" (pp. 285–6). (This qualification that the most a firm can hope for is a monopoly in its own district is always present. Cf. p. 459 n.)

However, Marshall is convinced that this cannot be. "Long before this end is reached, his progress is likely to be arrested by the decay, if not of his faculties, yet of his liking for energetic work" (p. 286). "Nature still presses on the private business by limiting the length of the life of its original founders, and by limiting even more narrowly that part of their lives in which their faculties retain full vigour" (p. 316). On the death or retirement of the owner, the firm would pass to his children, who would have age at least on their side. But Marshall does not rate their chances very highly. For a time, all may go well. The established connection of the firm, and the ability and interest of its employees, may mean that "mere assiduity and caution" will keep it going with reasonable success. "But when a full generation has passed, when old traditions are no longer a safe guide, . . . then the business almost invariably falls to pieces" (p. 300), unless it can be handed over to "new men."[2] A likely eventuality is that the children, or if not then certainly the grandchildren, will refrain from taking active control, and will sell out to a joint-stock company or a private firm.

[1] In the Second Edition this read "for a hundred years together," giving some idea of the length of time which Marshall thought it would take for a firm to come to dominate the industry. The same time period is still mentioned in the Eighth Edition (p. 315).

[2] The North Country expression "Clogs to clogs in three generations" is well known, though it is notable that Marshall does not use it. Instead, he gives the impression that, while "a century ago" it was often said that "the families of a rich man and his coachman would probably change places within three generations," conditions have now improved. He goes on to say that it is in the United States of America that the phrase "from shirt sleeves to shirt sleeves in three generations" is common, because of "the greater changefulness of conditions" and "the greater difficulty of keeping a business abreast of the age." Lord Stamp has called attention to the similar German expression, "the third critical generation" (ECONOMIC JOURNAL, 1926, p. 687). (See *Principles*, p. 621 n.)

This leads to a point which has been touched on already. What of the joint-stock concern? As we have seen, Marshall's views on this point changed over time. The passage in the " trees in the forest " which, in the first five editions, had read " as with the growth of trees, so it is with the growth of businesses " was changed in the Sixth Edition (1910) to read " as with the growth of trees, so it *was* with the growth of businesses as a general rule before the great recent development of vast joint-stock companies " (p. 316). Yet Marshall still believed that his hypothesis of the life cycle held " in many industries and trades." He also added the qualification that, while the joint-stock firm might grow in size, *it would not obtain increased internal economies* as it grew.

Nevertheless, it should not be supposed that Marshall had no doubts about the idea of the life cycle. In the Second Edition of the *Principles* he pointed out that it was subject to " an objection " (p. 487).

> " The objection is that the decay of human energies is after all a slow process, and that, if a large output would cost much less in proportion than a small one, an able and energetic man could often find the means of increasing his output tenfold or more within a period very short in comparison with the length of his own life. This also must be admitted. It is true that a man who is prospering can often borrow capital so fast, that the expansion of his business might be very rapid, if he could both market his new output, and at the same time obtain very important internal economies by every increase of his output " (Second Edition, p. 487).

In all the editions after the First, Marshall expressed the view that these two conditions—

> " are seldom combined in the same industry. There are many trades in which an individual producer could obtain much increased ' internal ' economies by a great increase of his output; and there are many in which he could market that output easily; yet there are few in which he could do both. *And this is not an accidental, but almost a necessary result* [my italics].
>
> " For in most of the trades in which the economies of production on a large scale are of first-rate importance, marketing is difficult. There are, no doubt, important exceptions. A producer may, for instance, obtain access to the whole of a large market in the case of goods which are so simple and uniform that they can be sold wholesale in vast quantities. But, most goods of this kind are raw produce; and nearly all the rest are plain and common, such as steel rails and calico; and their production can be reduced to routine, for the very reason that they are plain and common . . . in short there remains no very great difference between the economies available by a large and by a very large firm; and the tendency of large firms to drive out small ones has already gone so far as to exhaust most of the strength of those forces by which it was originally promoted " (p. 286).

In the Second Edition Marshall included a paragraph here to explain that even in these industries firms might be able, by cutting out middlemen in distribution, to build up their own sales connections and make the market imperfect; so it would not be amenable to complete monopolisation. This argument was later dropped.

In all the Editions after the First, however, Marshall proceeded to explain that there were many industries where considerable internal economies were available but where none of these could be turned to advantage. The goods in question were specialities, and the firms therefore had their own special, limited markets, which could not be extended at all quickly. As a result, Marshall thought that though the firms in question were capable of reducing unit costs as they expanded their output, they would not in fact be able to increase their output, because they remained limited to a small market which was acquired only " slowly and expensively " (p. 287). There was also the Schumpeterian point that " the very conditions of an industry which enable a new firm to attain quickly command over new economies of production, render that firm likely to be supplanted quickly by still younger firms with yet newer methods " (p. 287). Here again, it is the " life cycle " which is at work; " the full life of a firm seldom lasts very long."

Most of the above discussion is based on pp. 285–7 of the *Principles*; the earlier discussion of general versus special markets (pp. 678–83) was based on pp. 457–9. It is therefore very significant indeed that, in the Second and Third Editions of the *Principles*, these two sections of the argument, now separated by some two hundred pages of text, between them comprised almost the whole of Chapter 11 of Book V. They constituted a well-argued and impressive (though not, of course, conclusive) case in favour of Marshall's contention that even where industries were subject to increasing returns, the number of firms would remain relatively large, partly because of the life cycle, and partly because markets were imperfect. The separation of the two passages into different Books of the *Principles* occurred in the Fourth Edition (1898), and one cannot help feeling that much later confusion would have been avoided if the change had not taken place.[1]

It is clear, then, that Marshall conceived the individual business as possessing " unexhausted " internal economies, as the passage in the letter to Flux, quoted above, shows. These economies could not be turned to advantage because of the " life cycle " and market imperfections. But an increase in the demand for the product of the whole industry, which would presumably be shared more or less equally among all the " special " markets, would allow a rise in output and a fall in unit costs. As Mr. Shove argued, it would not be inconsistent to claim that, while firms may not be able to

[1] There is therefore certainly justification for Edgeworth's comment, in his review of the Second Edition of the *Principles* (ECONOMIC JOURNAL, 1891, p. 615), that the special difficulty which the law of increasing return presents " is stated more prominently " than in the First Edition. But was this difficulty really removed " more completely," as Edgeworth also claims?

increase their *share* of a constant aggregate output of the industry without experiencing a rise in costs of selling and transport, " if the aggregate output *does* increase, these diseconomies are absent or smaller so that, in that event, the expansion of individual firms *does* yield a net gain in efficiency." [1] It is Marshall's dynamic qualifications which must not be overlooked in any attempt to give an accurate summary of his analysis.

In Marshall's own day the life cycle was by no means an unreasonable hypothesis, though even for that period it had its faults, as Marshall himself seems to have seen. For example, he wrote: " Continued rivalry is as a rule possible only when none of the rivals has its supply governed by the law of increasing return . . . if one of them conformed to the law of increasing return the rivalry would soon cease . . . its advantage over its rivals would be continually increased until it had driven them out of the field " (p. 391 n.). Or, again, some industries " no doubt " have a large, common market *and also* increasing returns ; " they are in a transitional state, and it must be conceded that the statical theory of normal demand and supply cannot be profitably applied to them " (p. 501).

The most obvious conclusion is that the whole of Marshall's theory of the firm was a child of its own times, and one naturally wonders whether it is still worth studying to-day. In the post-Marshallian discussions it is Mr. Shove who has made the most interesting comment on this particular point.

> " In most industries we are faced, not with a population of transitory firms, each being born, rising to maturity and passing on through old age to death, but with a number of more or less permanent business units or employment nuclei, each with its own individuality, each expanding and contracting from time to time as its luck waxes or wanes, its managers grow slack or make way for new blood, fashion ebbs and flows, but continuing in existence more or less indefinitely; and we must conceive of equilibrium in the industry as a whole as arising, if it arises at all, from a dovetailing of their various phases of efficiency." [2]

This raises at least two problems which merit empirical study. First, is it realistic to suppose that the joint-stock firm is naturally less mortal than Marshall's private firm, particularly since he usually conceives of these as being taken over by " new men " when disaster comes? Second, do modern industries often (or even sometimes) display the kind of equilibrium which Shove describes? These are the kinds of question which Marshall would surely have been asking to-day, and, beginning from a more benevolent attempt to understand what Marshall had to say about the industry of his own day, these are the kind of questions which modern economists need to study and answer if our theory of the individual firm is to develop and improve.

D. C. HAGUE

University of Sheffield.

[1] Shove, *op. cit.*, p. 105.

[2] *Ibid.*, pp. 114–15.

SOME MARSHALLIAN CONCEPTS, ESPECIALLY THE REPRESENTATIVE FIRM

In a recent article in the Economic Journal (June 1954) on "The Representative Firm," Mr. J. N. Wolfe alleged that Mr. Sraffa and Professor Robbins had, in articles written more than twenty-five years age,[1] driven this Marshallian concept from the pages of the text-books. His intention is to revive and reinterpret the concept.[2] While I believe that Mr. Wolfe exaggerates the lethal effects of the Sraffa–Robbins articles—certainly in the United States—and while I sympathise with his aims, I believe that part of his reinterpretation is erroneous. He has, moreover, failed to notice a recent valuable article, "Alfred Marshall's Theory of Value," by Ragnar Frisch,[3] which gives the representative firm a high place. The pages which follow attempt to interpret some Marshallian concepts "about which one may rise even from a hundredth reading of Marshall with a certain muzziness in the head . . ."[4]

The first question to ask is: The representative firm is representative with respect to what? The answer is, I think, that it is representative with respect to its *unit cost*. But a principal assumption of the article by Professor Robbins was that the firm was representative with respect to *size*. Marshall does refer to size (and occasionally to organisation), but representativeness in such matters is not vital to his argument.

Confirmation of the view that unit cost is the key can be found in many statements in the *Principles*.[5] On p. 317, where the representative firm is mentioned for the first time, the marginal note is: "Forecast of our study of the cost of production in a *representative firm*." And in the accompanying paragraph (discussing the causes which govern the supply of a commodity) Marshall writes: "We shall have to analyze carefully the normal cost of producing a commodity, relatively to a given aggregate volume of production; and for this purpose, we shall have to study *the expenses of a representative producer* for that aggregate volume." On p. 342 he writes, "let us assume that the normal supply price of any amount of that commodity may be taken to be the normal expenses of production by that [representative] firm."

[1] P. Sraffa, "The Laws of Returns under Competitive Conditions," Economic Journal, 1926, pp. 335–50; Lionel Robbins, "The Representative Firm," Economic Journal, 1928, pp. 387–404.

[2] In his recent book, Professor E. H. Chamberlin states that if he "were doing it over again today some variety of carefully defined 'representative firm' might be substituted" in his *Monopolistic Competition* for the 'uniformity' assumption. *Toward a More General Theory of Value* (New York, 1957), p. 301.

[3] *Quarterly Journal of Economics*, November 1950. This article was a part of his lectures on economic theory given at Oslo University, 1933–38.

[4] Sir Dennis Robertson, *Economic Commentaries* (London, 1956), p. 17.

[5] All references are to the Eighth Edition.

Marshall's references to the *size* of the representative firm fall under two sets of assumptions: (1) where aggregate output of an industry is constant; (2) where aggregate output of an industry expands because of a sustained increase in demand.

The first case is explained in Book V, Chapter V, with the warning that " the complex problem of value must be broken up " (p. 366). Marshall had already, in Chapter II, discussed the *market* equilibrium in which " supply is limited to the stores which happen to be at hand . . . so that it cannot be influenced by cost of production " (p. 330). Now he is to examine the equilibrium of *normal* supply and demand of which the extreme simplification is " the stationary state." How much stationariness is to be assumed? Marshall here, as always, shied away from extreme conditions; in particular, he did not want to assume that " in our stationary state every business remained always of the same size and with the same trade connection." He preferred to assume that the representative firm—

> " remains always of about the same size, as does the representative tree of a virgin forest, and that therefore the economies resulting from its own resources are constant: and since the aggregate volume of production is constant, so also are those economies resulting from subsidiary industries in the neighbourhood, etc. That is, its internal and external economies are both constant " (p. 367).

Thus Marshall is here discussing conditions of stationariness as a preliminary to examination of the nature of short-run normal equilibrium. Even in an industry stationary with respect to aggregate output, firms may realistically be presumed to pass through a cycle of growth and decline; at any point of time their sizes and organisation will be dissimilar, and so will their unit costs. Attention should, therefore, be centered on the representative firm because its unit cost will govern value; it, and only it, is in equilibrium.[1]

If Marshall's analysis had stopped with the short-run normal equilibrium, the concept of the representative firm might not be profitable.[2] Of course, Marshall did not stop here. But I urge that, even in this simple case, Marshall's presentation has the special merit of keeping in view the presence of many non-representative firms even when the industry is in short-run normal equilibrium. Moreover, the identity of the representative firm changes because there is always movement up and down within the industry. Some firms will be gaining, others will be losing, internal economies.[3]

[1] Mr. Wolfe's statement, *op. cit.*, p. 343, that " Marshall's firm is never actually in equilibrium " seems to me to be wrong, and so also is his opinion that the representative firm has " unexhausted " internal economies (p. 341).

[2] This was Robbins' view, *op. cit.*, p. 396, where he called the device " superfluous " and " unnecessary."

[3] Frisch says (*op. cit.*, p. 409): " Occupying a central position in Marshall's theory of value is his conception of a *regular life cycle* for a private firm." Here again Robbins' view (*op. cit.*, p. 402) that the representative firm " preserves its essential identity while undergoing progressive expansion " seems to be in error.

For the representative firm, to be sure, internal economies are constant. But non-representative firms are not to be precluded, in this Marshallian stationary state, from altering the scale of plant and from achieving a better or worse distribution of overhead. Although the total number of firms in the industry remains the same, firms will rise and fall. The rising firms will, for a time, be able to lower unit cost by enlarging their scale of plant until they reach an equilibrium point; they will then be representative, and no more internal economies will be open to them. The declining firms, as their sales shrink, will not be able to cover overhead costs; they will have an inefficient distribution of overhead. *External* economies are *not* available to any firm—rising, falling or representative—because aggregate output of the industry is constant.

The theory of the short-run normal, slurred so deliberately by Marshall, was explored thoroughly in the 1920s and 1930s by economists who spelled out explicit assumptions, ranging from perfect to imperfect competition. In the process, Marshall was sometimes declared to have assumed perfect competition. Mr. Wolfe argues, and correctly, that this was erroneous.[1]

Marshall nowhere drew a set of curves (and he was a pioneer in their use) appropriate to the individual firm, and to it alone. His curves relate always to the industry or " trade "; and this is so even when they indicate also the cost situation of the representative firm.[2] Although Marshall never drew the familiar U-shaped curve, his abbreviated exposition shows that he had thought out its essential features: a division of cost into prime and supplementary, an equality of average cost, marginal cost and price at the equilibrium point (*Principles*, p. 810). Perhaps he foresaw, and shrank from, a formulation that required a narrow definition of a commodity, of marginal cost and of competitive conditions. But while Marshall *chose* to be fuzzy about all of them, he shows an amazing awareness of alternative definitions, as I shall now show.

In discussing what is a commodity, he states:

> " The question where the lines of division between different commodities should be drawn must be settled by convenience of the particular discussion. For some purposes it may be best to regard Chinese and Indian teas, or even Souchong and Pekoe teas, as different commodities; and to have a separate demand schedule for each of them.

[1] It seems unnecessary to offer more than a few references in support of this point, since it will be supported by the subsequent argument. Marshall on p. 341 states that he assumes " that there is no close combination among dealers on either side." But " normal does not mean competitive " (p. 347). Firms are very much concerned over " spoiling their markets " and avoiding resentment of other firms (p. 374); firms in some industries are supposed to have particular markets (p. 458).

[2] Sir Dennis Robertson seems unclear about this in his *Economic Commentaries*, pp. 19–20. He refers to the chart on p. 344 of the *Principles*, where Marshall represents the *long-run* normal supply curve *both* of the industry and of the representative firm. In this diagram Marshall indicates that when the industry produces *OM* units (yards of cloth), the *cost per unit* to the representative firm is *MP*. But *OM* is not the amount produced by the representative firm.

> While for other purposes it may be best to group together commodities as distinct as beef and mutton, or even as tea and coffee, and to have a single list to represent the demand for the two combined" (*Principles*, p. 100, note; see also pp. 105 and 391).

Emphasis of differentiation was not a feature of his formulation; he could, therefore, regard a number of firms producing substitutable commodities as making up an industry. His demand and his cost curves relate to a *commodity*, broadly defined—"fish," "fresh meat," "tea." The fact that resources are grouped into appropriate bundles to form firms is recognised, but Marshall always keeps in his exposition the diversity of these firms in any industry with respect to their unit cost, and, as a consequence, their size, organisation, profitableness. A representative firm can be recognised among this diversity, and, for purposes of brevity, analysis can be centered on it. But a firm does not typically remain representative, and sight should never be lost of the many firms which, at a point of time, are non-representative.

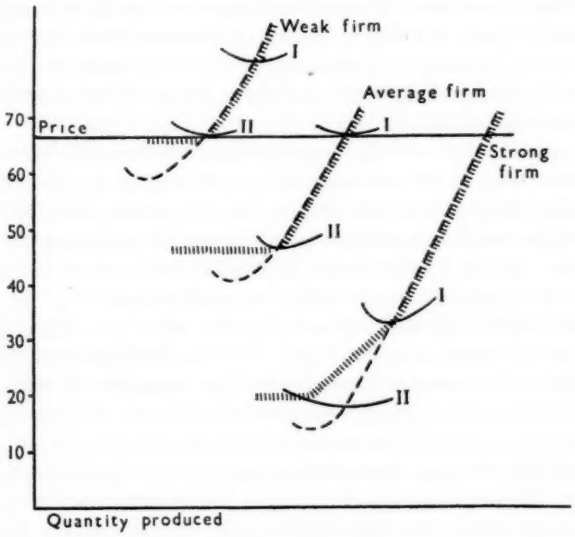
Since Marshall never drew curves appropriate to the individual firm, he did not draw a demand curve for an individual firm. He did, however, refer on one occasion to "the particular demand curve" for the product of a firm in an industry "adapted to special tastes" (*Principles*, pp. 457–8). Such a demand curve would, he says, be "very steep" because each firm would "be confirmed [sic] more or less to its own particular market." But Marshall nowhere assumes a horizontal demand curve; for him the demand curve for a commodity inclines negatively throughout the whole of its length.[1]

Another and related feature of Marshall's exposition is that the significance of marginal cost is played down.[2] In the short-run normal situation when the representative firm is in equilibrium so that price equals its average and marginal cost, the path of its marginal-cost curve shows how expansion or contraction of its output would take place in response to price changes. In the diagram below (which is adapted from Frisch) the solid lines I and II represent respectively total unit cost and variable unit cost, while the broken lines represent marginal unit cost. The shaded lines represent the actual behaviour of each of the three types of firms with

[1] Confusion sometimes still crops up concerning the meaning of the "demand curve" for a firm. For example, Sir Dennis Robertson, *op. cit.*, pp. 18–21, seems to think that the horizontal demand curve for a firm in perfect competition is a true demand curve, indicating the demand of buyers for a product. This is not so. The horizontal curve indicates merely the assumption made by the *firm* concerning the effect on its revenue of an attempt by it to expand or contract its sales—that its effect on price is zero. But such a curve does not show consumer response, and Sir Dennis' criticism of Frisch for drawing a sloping demand curve for the product of an industry, and *for the representative firm*, is not relevant. Perhaps the assumption of Marshall most relevant to the modern assumption of a horizontal average revenue curve is "that there is only one price in the market at one and the same time" (p. 341).

[2] Mr. Wolfe has glimpsed this aspect of Marshall. He argues that the representative firm fits into the anti-marginalist economics of Mr. P. W. S. Andrews.

respect to output as price changes. For the average, *i.e.*, the representative firm, the shaded line coincides with marginal cost with the exception of the lower portion (after price has fallen to 46 cents). This divergence indicates that, when price falls to 46 cents the average firm will halt production and cease to be guided by its marginal cost. But the marginal-cost curves of the weaker and stronger firms will be much less informative with respect to output behaviour. The weak firm, in the event of a fall in price below the equilibrium level of 66 cents, will halt production. The strong firm, confronted with a sharp fall in price, will practise what Frisch calls " a restrictive



strategy," *i.e.*, after price falls to 33 cents, it will curtail production more sharply than is indicated by the downwards path of the marginal cost curve, and when price falls to 20 cents, it will halt production.[1]

In short, even in the simple case of the short-run normal, Marshall focuses attention of " the nature of marginal production " (*Principles*, p. 372) rather than on the marginal cost of a small parcel of goods. The " true marginal supply price for short periods . . . is nearly always above, and generally very much above the special or prime cost " (*Principles*, pp. 374–5); it is prime cost *plus* a slice of supplementary. In the difficult case of the long-run normal, when the supply of the stock of appliances can be altered, the concept of a marginal increment is much more intricate. He advises his readers that this will require " a more detailed study of that

[1] The marginal-cost curves for the weak and the strong firms will, however, show their output response to an *increase* in price above the normal of 66 cents.

extremely complex notion, a marginal increment in the processes of production of a representative firm" (*Principles*, p. 376 note).

The next step for Marshall is to modify his stationary state by assuming a long-run increase in demand for the product of an industry. "In this world . . . every plain and simple doctrine as to the relations between cost of production, demand and value is necessarily false: and the greater the appearance of lucidity which is given to it by skilful exposition, the more mischievous it is" (*Principles*, p. 368). He turns, therefore, from the stationary state to "the *statical* method" and his well-known "illustration from the fishing trade." The commodity produced is "fish." The price of fish oscillates because of short-run changes; it oscillates also because of general forces which, if long sustained, will cause firms to readjust their stock of "the appliances for production." An increase in demand which promises to be permanent may, therefore, bring about a decrease in the cost of production of fish.

The increase in demand and aggregate production will have a short-run effect on every firm, from weak to strong, prolonging the life of the former and increasing the profits of the latter. The important effect for the industry as a whole is, however, best studied by examining the effect on the representative firm, *i.e.*, the firm which was in equilibrium before the change and which will show also the new position of equilibrium.[1]

The increase of demand will not, in the short run, bring new *internal* economies to the representative firm. A scale of plant appropriate to the prior situation will remain appropriate to a situation in which the only change is a larger aggregate output for the industry. If the representative firm had access to internal economies, when it supplied 1% of an industry output of 1,000,000 units, an industry output of 1,100,000 would not bring new access. What of the effect on rising non-representative firms? They would certainly reach a representative position more quickly, but their unit cost in equilibrium should then be identical with the prior one. Only if the assumption is made that the larger output and profits lead to a structural change in the industry, *e.g.*, that firms, instead of producing varieties of a commodity, are able to specialise, would a lower cost emerge. While such an assumption may be realistic, it seems to stretch even Marshall's flexible premises too far. Prior equilibrium in an industry would appear to debar the emergence of specialisation *internal* to it.

Would the increase in demand bring *external* economies? Would firms in subsidiary trades be able to secure economies—internal economies—and thereby reduce the unit costs of what they supply to the original (fishing) industry? Here again the answer is in the negative. If a subsidiary industry was in equilibrium before the increase in demand, why should

[1] Frisch says: "The representative firm is to give a miniature illustration of the supply side, in the sense that if we want to know how total supply will react, we may simply study how the representative firm will react" (*op. cit.*, p. 512).

its representative firms, any more than representative firms in the original industry, now gain internal economies? Nor is the argument advanced by focusing attention on rising non-representative firms unless, as above, the assumption of a structural change in the industry is made.

Suppose, however, that the subsidiary industry is *not* in equilibrium. More specifically, suppose it is a loosely defined number of firms, none of them in a representative position, producing a variety of products, rather than a type of product. The increase in demand might then stimulate specialisation, with lower unit costs of some of the products. Or suppose that the larger demand for the product of the original industry stimulates the development of better—more specialised—marketing facilities.[1] In both cases external economies would accrue to the original industry.

This interpretation is, I believe, that of Allyn Young. He argued that the chief economies of increasing returns arose out of extension of capitalistic or roundabout methods of production, which, in turn, depended on extension of the market.[2] The individual firm cannot do much to make its operations more roundabout, and, therefore, secure economies. Roundabout methods, with their potential economies, are achieved by the splitting-off or segregation of " the operations of specialized undertakings which, taken together, constitute a new industry " (p. 539). These counter forces, which defeat the forces making for economic equilibrium, are pervasive and deeply rooted; they are the essence of what Marshall calls " the high theme of economic progress " (*Principles*, p. 461).

In all cases the external economies which come to the representative firms in the original (fishing) industry may, *with a lag*, open to them the chance of new *internal* economies. The average cost of the representative firm may move to a lower position because of internal *and* external economies.[3]

The Marshallian concepts of external and internal economies, and of increasing and decreasing cost, are marks of disequilibrium in the economy;

[1] Sraffa had this possibility in mind. See " Increasing Returns and the Representative Firm," Economic Journal, 1930, p. 92.

[2] "Increasing Returns and Economic Progress," Economic Journal, 1928, pp. 527–42. He opened his article with the warning that the apparatus of economists for dealing with technical questions of equilibrium " may stand in the way of a clear view of the more general or elementary aspects of the phenomena of increasing returns."

[3] The increase in demand and the growth in output of the industry may, however, *not* bring economies. If firms in the subsidiary industries are unable to produce at lower cost, external economies will not develop for firms in the original industry. The outcome will be either long-run constant or increasing cost. In the latter case it is reasonable to suppose that the chief effect of the increase in demand will be a larger number of firms in the industry with no change in the size of the representative firm. Sir Dennis Robertson (*op. cit.*, p. 19) thinks, incorrectly in my opinion, that Frisch left out the possibility of such a change in the number of firms. Sir Dennis supposes long-run constant cost in an industry where the representative firm cannot expand except at higher unit cost. In this case, an increase of demand would bring multiplication of the number of firms. A diagram would show the short-run average total unit cost curve of the representative firm moving to the right along a horizontal line. Each point of tangency would indicate the long-run equilibrium output of the industry; it would *not* indicate output of the representative firm.

their existence indicates disequilibrium. Marshall wanted to go beyond the sterile concept of complete static equilibrium. He therefore broke with it by assuming equilibrium in an industry, with disequilibrium among the firms within the industry. This made necessary the device of the representative firm; it is in equilibrium and it shows the normal. This formulation required also the concept of internal economies (but not of external, or of decreasing or increasing, costs). Marshall then took a next step away from static equilibrium by assuming an increase of demand which put the industry out of its equilibrium. As a result, the concept of external economies emerged, and with it, the concepts of increasing and decreasing cost.

In this modest exercise in the statical method the only force allowed out of the " pound called *ceteris paribus* " is a sustained increase in demand.[1] But this change, operating on firms which are diverse in terms of their prospects, may bring about the phenomenon of decreasing unit cost. The concept of the representative firm was, therefore, necessary to deal with (limited) dynamic change.[2] For the long-run case of decreasing cost, the term " margin of production " has no significance, and " the term ' margin ' should be avoided " (p. 805). The significant unit is not " a single rifle or yard of cloth," but the representative firm.

Marshall never pushed analysis of decreasing cost beyond an elementary stage. He was aware that decreasing cost would, if it continued, lead to monopoly (*Principles*, pp. 286, 397 and 459); and his brief discussion of this case deals always with *internal* economies, especially improved organisation. While the focus might seem to make monopoly in industry a pervasive and acute issue, Marshall showed little concern about it. Perhaps he thought the operation of decreasing costs was very long-run. Or perhaps he felt that, while economies of organisation were larger as aggregate output grew, these were often offset by increases in marketing costs (*Principles*, p. 286).

JAMES A. MAXWELL

Clark University.
Worcester, Mass.

[1] Substantive new inventions are *not* to be supposed. *Principles*, pp. 460 and 497.
[2] Robbins, *op. cit.*, p. 396, argues the opposite.

A PYRRHIC VICTORY

I

EVER since the publication of the General Theory, a struggle has gone on between the Keynesian and the adherents of what has become known as the Loanable-fund Theory. In famous papers Ohlin and D. H. Robertson opened the counter-attack on the General Theory; the last and apparently victorious gun was fired by S. C. Tsiang, in an article, "The Liquidity Preference and Loanable Funds Theory," in the *American Economic Review* of September 1956.

A future historian of doctrine will recall this controversy with mixed feelings. For, with minor exceptions, the loanable-fund theorists did not criticise the empirical assumptions of the Keynesian approach—its behavior functions as we may say; and although they justly disputed certain conclusions of the General Theory as not following from the Keynesian definitions and empirical assumptions, the purified Keynesian model, set up by Reddaway, Hicks and Lange, through its mathematical symbolism, made sure of the logical approach and allowed a simple answer to such heatedly disputed questions as to whether an upward shift in the saving propensity would lower or raise the interest rate.

Nor was it the aim of the loanable-fund theorists to re-examine the history of doctrine and to show that the Keynesian approach was virtually contained in some older writers of this denomination; at least as far as the present writer's knowledge goes, they never have quoted an author who before 1936 had demonstrated that the combination of the liquidity preference, as function of income and the interest rate, with the consumption function and the "marginal efficiency of capital" suffices to determine both income and interest rate. Surely, John Stuart Mill, who seems to have been the first to formulate a demand supply approach to determine the interest rate,[1] did not dream of it. The loanable-fund school was only interested in showing that from Keynesian building blocks (possibly with slight modifications) there could be constructed also a *flow* equation, in which one side is identifiable with the demand for loans as function of the interest rate and the other side with the supply of funds, also as function of the interest rate.

But is it really worthwhile developing "equivalent" models—in other words, models which express the same thing as has been expressed before in an, after all, not much more complicated way? And if we have two

[1] *Principles of Political Economy*, Book III, Chapter XXIII. The classicist authors only bothered about profits; in Senior's *Outline of the Science of Political Economy* (1836), *e.g.*, the term "interest" does not appear.

equivalent models which shall we choose? Secondly, are the *behaviour* functions common to both the Keynesian and the loanable-fund model to be considered as undisputed—in other words, do we have now a macro-economic interest-rate theory on solid foundation?

To answer the first question let us consider Mr. Tsiang's model. Also the Keynesian will recognise that Tsiang avoided the Marshallian fallacy[1] of treating in the demand function the income as a parameter, which would be independent of the interest rate. Neither Ohlin or Robertson showed a great interest in these aspects of the Keynesian approach. Nor did, to mention another well-known attempt, W. Fellner and H. Somers show such interest in their geometrical construction of the loanable-fund approach.[2]

Tsiang's procedure is to embed a Robertsonian demand–supply equation—" Planned current gross saving plus net decrease in the demand for idle money plus net creation of new money = current planned gross investment [3] "—into a system of behaviour function for consumption, investment, holding of idle funds and supply of money. We call this equation " Robertsonian " not so much because, with modifications, it is a symbolic presentation of Robertson's scheme of 1940, but primarily because saving is defined as the difference of Robertsonian income (income earned " yesterday ") and current consumption. Past income may have been chosen in lieu of the Keynesian currently earned income because Tsiang wanted only the interest rate to appear as endogenous variable in a supply–demand equation for loanable funds, making this equation in a sense self-sufficient.[4] In any case, Robertsonian saving is the only concept usable in the loanable-fund approach; defining saving on the basis of current income inevitably

[1] Marshall was, of course, aware that income is one of the determinants of saving; see *Principles*, Book IV, Chapter VII, paragraph 7. But his aversion to algebraical equation systems prevented him from formulating a theory which would do justice to this relation.

[2] " Alternative Monetary Approaches to Interest Theory," *Review of Economic Statistics*, Volume 23, February 1941. The model is, moreover, over-determined. In the Chart 2, supply of money, the curve M, indicating the existing quantity of money, is obtained by adding three components which were independently determined as functions of the interest rate or introduced as parameter, viz., the fund M_a designed to acquire commodities, the fund M_b designed to be retained and the fund M_c designed to acquire claims; but M is also described as an independent function of the interest rate, portraying the willingness of the banking system to provide money. (If M were a parameter it would be represented by a perpendicular line, again different from the total of the components.) Algebraically we have $M_c(r) + M_b(r) + M_a = M(r)$; this determines the interest rate r and does not leave room for the authors' second equation $M_c(r) = L_c(r)$, where L_c is the supply of claims.

[3] We are going to discuss in the text the meaning of the term " planned " in connection with gross saving. In connection with gross investment the term indicates the current demand for investible funds and is identical with Keynes' investment plus depreciation.

Gross investment is, of course, not identical with the demand for loans. Let us assume that the decisions about increasing the firm's own capital and about consumers' loans are governed by the same factors as gross investment, viz., " yesterday's " income and the interest rate.

[4] Tsiang calls " yesterday's " income an " exogenous " variable, in terms of which the truly endogenous variables can be expressed. However, if current income is given in terms of income one period backward, the time path of income is determined by the initial conditions, and yesterday's income is not truly exogenous.

leads to something like the Keynesian model. In the Keynesian definition monetary expansions cannot finance investment, in the sense of increasing its current rate, without creating an equal amount of saving; therefore not both, monetary expansion and saving, can be entered additively. Nor can we deduct in the saving–investment equation monetary funds withdrawn from circulation; we need a second monetary equation such as the Keynesian for completing the model and determining the interest rate. In the Robertsonian approach, on the other hand, the increase in the active money stock since "yesterday" though acquired to-day by some economic unit (through its exertions or through capital liquidation) is not yet "saving" of the economic unit; monetary expansion which had materialised *before* "to-day" affects also the Robertsonian income and saving and cannot be entered as a separate source of financing investment.

It should be noted that the distinction between the two approaches is purely terminological and that the quantities entered in the Robertson–Tsiang basic equation for changes in the money stock and the idle balances depend on the length of the "day," which can be chosen arbitrarily. In particular, it would be erroneous to associate the Robertsonian *definition* of income and saving and of the time lag appearing in it with the *behaviour function*, in which consumer spending is related not to the currently earned income but to income earned some time before the spending materialised; Tsiang, indeed, considers both current consumption and current investment as governed by "yesterday's" earned income, but this hypothesis concerning the behaviour functions is not an essential part of his system, and could be replaced by functions in which consumption and investment are related to current income.[1] One could even use the Robertsonian income concept,

[1] The original Keynesian model can be easily transformed into a flow equation. Let us assume a linear relation between transaction balances T_t and income Y_t and choose the time unit so that $Y_t = T_t$; furthermore, let us treat M_t as a function of the current bank reserves R_t and the interest rate r_t. Denoting the speculative or "idle" balances by $Mi_t = Mi(r_t)$, we have:

$$(1)\quad Y_t \equiv C_t + I_t$$
$$(2)\quad M_t \equiv T_t + Mi_t + Y_t + Mi(rt)$$

The second equation can be re-written as total differential where, following Tsiang, we denote by $\Delta x_t = x_t - x_{t-1}$ a small finite change in any variable x_t.

$$(2a)\quad \frac{\delta M}{\delta R}\Delta R_t + \frac{\delta M}{\delta r} - \Delta r_t = Y_t - Y_{t-1} + \frac{dMi}{dr}\Delta r_t$$

Adding (1) and (2a), cancelling and rearranging, we obtain:

$$(3)\quad (Y_{t-1} - C_t) - \frac{dMi}{dr}\Delta r_t + \frac{\delta M}{\delta R}\Delta R_t + \frac{\delta M}{\delta r}\Delta r_t = I_t$$

This is Tsiang's equation (7).

The procedure throws some light on the state of equilibrium indicated by the Keynesian model. In the Keynesian equilibrium all transaction balances are in the hands of income receivers. Firms' money holdings (if any) would only consist of "idle" balances and of transaction balances designed to finance investment, not to pay workers nor to acquire materials during the process of reproduction; for the latter purpose firms by selling commodities would *temporarily* acquire transaction balances between time-points t and $t + 1$.

though consumption is related to currently earned income, and write consumption as a function of " to-morrow's " Robertsonian income, although, of course, nobody would use so clumsy a conceptual framework.

It is worth noting that the Swedish distinctions between expected and unexpected, intended and unintended, voluntary and involuntary, planned and unplanned magnitudes have tended to become fused with the Robertsonian time-lag concept, *i.e.*, have been transformed from the description of behaviour into definitions. Robertsonian saving is then termed intended, expected, voluntary, planned, and the difference between Keynesian and Robertsonian saving is the unexpected, unintended, involuntary, unplanned component; any reference to the actual processes of anticipation and planning is removed.[1]

But though logically the question of how to define income and saving must not be confused with the question of what consumer's behaviour is empirically, the requirement of simplicity of a conceptual framework will lead the economists to choose the Robertsonian concept if the consumer in a well-defined way looks to past income, and the Keynesian notion if he does not. The positive form of the condition " if the consumer looks in a well-defined way, etc.," is deliberately chosen. One has argued that the very impossibility of spending current income earned in a very short period—say one hour—*during the same period* militates against the use of the Keynesian concept; for the Keynesian marginal propensity to consume from currently earned income would then be zero for a very short period,[2] and positive for a longer period. The use of the Robertsonian concept would indeed avoid these complications provided only that the " day " is approximately of the same length for the vast majority of income receivers. If this is not the case and if no orientation to past income can be established for the bulk of consumers, the use of the Robertsonian income concept and of the loanable-fund formulation has no advantage. We must either be satisfied with something like the Keynesian model, in which the behaviour functions are defined for sufficiently long periods, or we must find dynamic links outside the consumption function.

II

We have shown that for reasons of expediency the choice between the Keynesian and the equivalent Loanable-fund version is to be decided on *empirical grounds*. It depends on the consumer's orientation to current or past income. Even here the loanable-fund theorists shied away from the discussion of the behaviour function itself. In all other cases they accept

[1] Note, *e.g.*, the use of the Swedish concepts in Lundberg, *Studies in the Theory of Economic Expansion*, pp. 90, 140, 164. For a criticism of the original Swedish concept see G. Haberler, *Studies in Income and Wealth*, Volume 2, 1938, p. 155–8, especially footnote 25, and H. Neisser, " The Nature of Import Propensities and the Foreign Trade Multiplier," *Economia Internazionale*, August 1949.

[2] Would that be correct also when the earned income *falls*?

the Keynesian functions.[1] But there would have been good reasons to doubt the theoretical validity of both the consumption function and the investment function (or " marginal efficiency of capital ").

Marshall had recognised the influence of both income and interest rate on the flow of current saving; and Keynes was satisfied to take over the function, shifting to income the accent away from the interest rate (which was restored by Hicks). However, the pure theory of saving as developed by Irving Fisher and Ramsay and accepted by the mathematical economists does not support the view that for a given level of income, Keynesian *or* Robertsonian, and a given interest rate the individual's flow of saving would be constant over time.[2] In this theory, saving is considered as resulting from maximisation of satisfaction *over time*, the horizon possibly being extended to encompass the satisfaction of future generations. For given income, current and expected, for a given pattern of tastes and needs and a given interest rate, the consumer would aspire rather at a certain stock of assets to be enjoyed during retirement or other low-income periods in his life, and would not set aside period by period the amount of saving which a consumption function such as the Keynesian would indicate.

Before accepting either the Keynesian model or the loanable-fund version, a re-examination of the theory of saving seems to be indicated. Do the other motives of saving—the " impurities "—operate in the direction of a constant flow of saving, given income and the other variables? Or do, under certain conditions, even the consumers' endeavors to maximise satisfaction over time bring about in the aggregate a flow of saving proportionate to aggregate income?[3]

Even more serious doubts exist as to the theoretical validity of the

[1] Tsiang, indeed, also attacks Keynes' liquidity preference. He claims that this function is " dependent " on the investment and consumption functions (p. 554, footnote 20, and p. 555, top). Liquidity preference is here meant in a wider sense, including the " preference " for transactions balances; the independence of the demand function for idle balances is not questioned. But this is a confusion of the *quantity* M_1 of transaction balances (plus precautionary balances) actually held in equilibrium with the *function* $L_1(Y)$, which relates this quantity to income—a confusion facilitated by the convention according to which one frequently uses the same symbols for the quantity *and* the function. If the right side of Keynes' monetary equation is broken up into additive components $M = M_1 + M_2 = L_1(Y) + L_2(r)$ and we write $M_1 = L_1$—$[I(Y) + I(r)]$, it is clear that we can insert for C and I *any* function without impairing the independence of the L_1-function; though, of course, if Y and r are *determined*, M_1 is also determined. This result is concealed in Tsiang, because, quite justifiably, he took as L_1-function a constant, and, by choosing the time unit appropriately, made this constant equal to unity. Changing in this way the function $M_1 = L_1(Y)$ into $M_1 = Y$ does not make the L_1-function " dependent " on the other function; on the contrary, $M_1 = Y$ holds *regardless* of the form of these functions.

[2] From the econometric angle attention has been drawn recently to the Fisher approach by F. Modigliani and R. Brumberg, *Utility Analysis and the Consumption Function*, in: *Post-Keynesian Economics*, edited by K. K. Kurihara (1954), and by M. Friedman, *A Study of the Consumption Function* (NBER Monograph No. 63, 1957).

[3] In a not yet published larger study, *The Demand for and Supply of Capital Funds*, the present writer was able to answer this question in the affirmative for times of favourable investment opportunities.

investment function. What justifies the assumption that, given prices, interest rate and production functions, the firms will take in the same amount of funds period by period? Is it not classical teaching that the current supply of capital funds if maintained at a certain level will *depress* the interest rate, except for sustenance from technological progress or appropriate growth in the other factors? The same Mill who first formulated the loanable-fund theory states (*ibid.*, paragraph three): " since, when a few years have elapsed without a crisis, and no new and tempting channel for investment has been opened in the meantime, there is always found to have occurred in those few years so large an increase of capital seeking investment, as to have lowered considerably the rate of interest." The conclusion would be that, for a given production function and given levels of variables, the firm wishes to *possess* a certain operating capital, *i.e.*, to be indebted to a certain amount, not to borrow, period by period, a certain amount.

Writing the stock demand function, by which we replace the investment function, as $D[r(t)]$ and abbreviating the supply of funds function as $s(r_t, Y_{t-1})$, where r is the interest rate and Y is income, we would have, in the aggregate, another " loanable-fund " theory

$$\int_0^t s[r(t),\ Y(t-1)]dt = D[r(t)]$$

The difference between the flow-demand approach

$$s[r(t),\ Y(t-1)] = f[r(t)] \text{ (where } f \text{ is the flow-demand)},$$

and the stock-demand approach is obvious. Tsiang can belittle it only because for him the difference is not a difference in *behaviour* functions (his supply demand equation also contains *stock*-demand and *stock*-supply function), but in *equations*. From our stock-demand equations we could derive a flow equation

$$s[r(t),\ Y(t-1)] = dD/dt = D'\dot{r}$$

Does that make the two approaches, Tsiang's supply-demand equation mentioned above and our stock-demand equation, " equivalent "?

III

We may hope that the theoretical work in the field of the interest-rate theory will turn away from the shadow boxing of Keynesian and loanable-fund theorists to the real problems, some of which we have sketched in the preceding section. Let us express here also the desire that a closely related issue will not be resurrected, viz., the discussion of whether the interest rate is determined in the market for loans or in the market for money, or, as it is also expressed, not by the supply of and demand for loanable funds, but by the supply of and demand for money. The historian of economic doctrine

will be even more surprised by this formulation than by the desire to find in loanable-fund terms a statement " equivalent " to the Keynesian model: for the simple reason that there is no separate market for money nor a demand for and supply of money separate from the demand for and supply of commodity and loans.

Already Hicks had correctly termed this issue a sham issue (*Value and Capital*, Chapter XII, Section 1). But he could not persuade the parties in the dispute, because he retained the notion of the demand for and supply of money as separate from the demand for and supply of commodities and loans: " to say that the net acquisition of money by trading is zero taken over the whole community, is the same thing as to say that the demand for money equals the supply of money " (*ibid.*, Section 3). By no means! The first statement is an identity, the second, according to Section 3, second paragraph, must be understood as an equation between functions such as the demand and supply functions for sugar.[1]

Professor Lange [2] faithfully drew the conclusion from the Hicksian approach by defining the supply of money (S_n), meaning the good serving as *numéraire*, as the sum of the outlays for all commodities, including assets but excluding the *numéraire*, and the demand for money (D_n) as the sum of all proceeds from selling commodities, including assets but excluding the *numéraire*. S_n and D_n become in this way functions of all prices $p_1 \ldots p_{n-1}$, a relation later disregarded by Lange. These demand and supply concepts are not more useful than the Hicksian ones.[3]

The origin of this unfortunate quarrel can be found in a certain twist which Keynes at some place gave to his system. Having realised the impossibility of Marshall's partial equilibrium approach in the theory of interest, having rewritten Marshall's supply–demand equation as what amounts to " Saving as function of income equals investment as function of the interest rate and the parameter expectations," he then restored the partial equilibrium approach by adding a monetary equation in which, confusedly, the behaviour is described as a function of only one variable, namely

[1] " To determine the n prices, we have $n - 1$ equations of supply and demand for the $n - 1$ commodities (exclusive money), one equation of supply and demand for loans, and *one for money*." (Italics mine!)

[2] " Say's Law: A Restatement and Criticism," *Studies in Mathematical Economics and Econometrics* (1950), p. 50.

[3] Lange then proceeded to add to the outlay for commodities the demand for the *numéraire* and to the sales proceeds the supply of the *numéraire*, obtaining an identity (aggregate outlay plus aggregate intake equals aggregate intake plus aggregate outlay), which he baptised with the grand name of " Walras' law," because, allegedly, " Walras was the first to recognise its fundamental importance." The reference given to Walras (*Économie Politique Pure*, § 116) is to a passage in the *Theory of Exchange of Several Commodities for One Another*; the term " Walras' Law " would better be reserved for the parallel passage in the *Theory of Production* (paragraph 206); here Walras states the equality of the revenue obtained by the productive services and the sales value of the products including the *numéraire*. This is an identity only in absence of money proper; in presence of money proper it is a condition of *monetary equilibrium* in the sense of Say's law, whose role in Walras' system deserves a renewed careful analysis.

the interest rate (and the parameter conventional interest rate). "If, however, we introduce the state of liquidity preference and the quantity of money and these between them tell us that the rate of interest is r_2, then the whole position becomes determinate" (*General Theory*, Chapter 14, Section I, p. 181). This approach confused the liquidity preference in the narrower sense, which is the desire to hold speculative balances, with the liquidity preference in the wider sense, viz., the holding of balances of all kinds, where also income appears as a determining variable.

Whatever the empirically correct behavior functions for the holding of balances, the monetary equation in the Keynesian model, in which the stock demand for balances is equated with a given stock or supply of money, cannot be considered as referring to a separate market for money, but reflects some facets of the behavior of consumers and investors, which *at the same time* governs the supply and demand for commodity and loans.

HANS NEISSER

New School,
New York.

ON GROWTH MODELS AND THE NEO-CLASSICAL RESURGENCE [1]

I. The Attack on the Growth Models

The relatively prosperous decade of the fifties has been replete with retreats from the economics of the thirties. It is good that economists are ready to meet the social issues of their own day; the problem of underemployment in a developed capitalist economy has hardly the urgency of yesteryear. But ills rooted deep in the structural relations of an economic system have a way of recurring, unless those structural relations are adequately and permanently changed. There is hence purpose in clarifying and preserving from distortion in later lights some of the now older diagnoses.[2]

In recent journals several respected economists have joined the attack on growth-cyclical models of the Harrod–Domar–Hicks variety. I submit that these models are such, in their inspiration and assumptions, that the attacks can be successful only with the inclusion of an apparently unintended target—Keynes. I propose to make clear the Keynesian content of the growth models and to redress somewhat the current balance by defending and building upon the Keynesian heritage.

The banners of the attackers are strikingly similar. James Tobin rebels against the concept of "straight and narrow paths from which the slightest deviation spells disaster." [3] Kenneth Boulding ridicules the "H–D–H" or "Hiccup" dynamic with its "dismal," "gloomy," "masochistic" prophecies.[4] Robert Solow rejects "the characteristic and powerful conclusion of the Harrod–Domar line of thought . . . that even for the long run the economic system is at best balanced on a knife-edge of equilibrium growth." [5] All three see the basic problem raised by the Harrod–Domar–Hicks growth model enthusiasts as the unique result of (arbitrary and unwarranted) assumptions of fixed proportions of the factors of production. More completely, in the words of Tobin, "Contemporary theoretical models of the business cycle and of economic growth typically possess two related

[1] The writer is indebted to Norman F. Byers, Alfred H. Conrad, F. H. Hahn, Harry G. Johnson, Alvin L. Marty, Tibor Scitovsky, Robert Solow, James Tobin and Fred M. Westfield for helpful reactions and suggestions. He wishes to acknowledge, in particular, the valuable and detailed comments of Robert H. Strotz. The paper was prepared in part during the tenure of a Social Science Research Council Faculty Research Fellowship.

[2] This paragraph was written, with perhaps pardonable truculence, in the pre-recession summer of 1957.

[3] "A Dynamic Aggregative Model," *Journal of Political Economy*, Vol. LXIII (April 1955), 103–15.

[4] "In Defense of Statics," *Quarterly Journal of Economics*, Vol. LXIX (November 1955), especially pp. 492–5.

[5] "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, Vol. LXX (February 1956), 65–94.

characteristics: (1) they assume production functions that allow for no substitution between factors and (2) the variables are all real magnitudes; monetary and price phenomena have no significance" (p. 103).[1] Generally, the attackers argue that with consideration of variable-factor proportions and flexible prices, *unlike* in the Harrod–Domar–Hicks models, not one but a variety of warranted rates of growth become possible and the economy will be free to adjust to whatever rate is appropriate for full employment.

II. What Harrod, Domar and Hicks Really Said

It can be shown quickly that the growth models *did* encompass variable factor proportions and reasonable operation of the money–price mechanism. First, in Harrod's formulation, G_w, the warranted or self-sustaining rate of growth, depends upon s, the proportion of income saved (or that proportion remaining after saving is utilised in "autonomous" investment and export balances), C_r, the "required" or equilibrium, current capital–output ratio which leaves entrepreneurs satisfied, and d^* (for "deepening"),[2] the proportion of output absorbed in lengthening the production process or increasing the capital–output ratio. Algebraically,

$$G_w = \frac{s - d^*}{C_r} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

or

$$G_w C_r + d^* = s \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.1)$$

In this latter form the above equation expressed directly the condition of equality between the proportion of output for which there is investment demand ($G_w C_r + d$) and the proportion of output saved (s).[3] If the actual

[1] In "Complementarity and Long-range Projections," *Econometrica*, October 1956, pp. 429-50, which came to the writer's attention when this paper was in penultimate draft, P. J. Verdoorn also relates the Harrod–Domar models to an assumption of complete lack of substitutability of factors. The implication of Verdoorn's work is that this complementarity assumption may prove not unreasonable for purposes of prediction or as a description of the medium-long-run adjustment powers of the economy. But Verdoorn's thesis is also consistent with the argument we shall develop, that there *is* substitutability but that *economic* constraints limit crucially the range of admissible factor ratios.

[2] Harrod used the symbol d to denote deepening; we have changed this to d^* in order to avoid confusion with the differential and derivative symbol, d.

[3] If we write capital as

$$K = Y \cdot \frac{K}{Y} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.2)$$

investment can be written

$$I = \frac{dK}{dt} = \frac{K}{Y}\frac{dY}{dt} + Y\frac{d(K/Y)}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.3)$$

and the ratio of investment to income is

$$\frac{I}{Y} = \frac{d \log Y}{dt} \cdot \frac{K}{Y} + \frac{d(K/Y)}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.4)$$

For the equilibrium condition described by the warranted rate of growth it is presumed that K/Y,

rate of growth is less than the warranted rate, investment demand must then be less than saving, and the rate of growth of output and (eventually) the rate of output must turn down. But if G_n, the "*natural*" rate of growth or maximum rate of growth of which the economy is capable under conditions of full employment, is less than G_w, then the *actual* rate at full employment would have to be less than G_w. It follows that investment demand would have to be less than saving at full employment. Thus full employment could at best represent a momentary position of disequilibrium. A critical aspect of the problem, then, can be formulated as how to prevent G_w from exceeding G_n. One way to do this is to have deepening—a positive value of d^*. Harrod states explicitly, "d may have a positive value because of the nature of the inventions occurring. It may also have a positive value because the rate of interest is falling. Our aim should be to get such a progressive reduction in the rate of interest that

$$G_w C_r = s - d = G_n C_r."$$

Harrods adds, "If d is positive, C_r will increase through time, and may eventually become so great as to enable us to dispense with d." [1]

Now, increasing capital intensity stemming from lower interest rates implies changing factor proportions and indeed, with linear, homogenous production functions (as assumed by Solow and Tobin), changes in the capital–output ratio must mean changes in factor proportions. Thus Harrod is saying that factor proportions *may* change so much—the economy *may* get so capital intensive—that the rate of growth necessary to absorb saving (the "warranted" rate, G_w) will be reduced to an acceptable level. But, Harrod continues, "The question we now have to ask is whether there will be any natural tendency for the rate of interest to come down sufficiently. *This is the crux of the matter* [emphasis added, R. E.], the crux, perhaps, of that modern economic situation to which we shall revert, when the post-war shortages cease." I submit that there can be no doubt that in Harrod's model factor proportions are quite variable and the money–price mechanism is free to operate as it will; there is no uneconomic, arbitrary, technological

---

the actual, current capital–output ratio, is the ratio currently *demanded*, and therefore equals C_r. Then if $\frac{d(K/Y)}{dt}$, or "deepening," is taken as the time rate at which entrepreneurs *demand* (*desire*) that the capital–output ratio change, $\frac{I}{Y}$ is the ratio of investment *demand* to output. The warranted rate of growth is that value of $\frac{d \log Y}{dt}$ (Harrod's G) for which

$$\frac{d \log Y}{dt} \cdot \frac{K}{Y} + \frac{d(K/Y)}{dt} = \frac{I}{Y} = s = \frac{S}{Y}, \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.5)$$

or that value which makes investment demand equal saving.

[1] *Towards a Dynamic Economics* (London, 1948), p. 96. This corresponds precisely, as should become clear below, to Solow's positive value for the rate of change of the capital–labour ratio ($r > 0$), leading eventually to an equilibrium ratio, r^* (*loc. cit.*, p. 70).

constraint.[1] However, as more capital is used, other things remaining equal, the return on capital must fall. The difficulty is that this fall may conflict with the Keynesian floor to the rate of interest or, more generally, with the rate of return on capital which entrepreneurs will find acceptable.

Domar, similarly, is clear in pointing out that the crucial issue is not whether capital–output ratios are fixed but rather whether they are free to adjust in such a manner as to eliminate " The Problem of Capital Accumulation." [2] Raising the question of the American economy's ability to continue indefinitely absorbing new capital at its rapid post-war rate, Domar writes:—

> " Implicit in this worry is the belief that the possibilities of the so-called deepening of capital (in the sense of an increasing ratio of capital to output) are limited. Therefore the amount of capital that the economy can absorb, at a given income level and over a given period of time, is limited as well. . . . We have thus assumed, at least for the purpose of this discussion, that there exists a fairly stable ratio between annual output (or national income) and the capital stock needed for its production, this ratio to be indicated by the letter *s*. While, strictly speaking, we shall treat *s* as a given constant, it need not be so. It is certainly not the same among various firms and industries. The national average (if such exists) can be made a function of time, interest rate, or of something else. *But it must have some stability, because if s can be anything, our argument falls through and we are back at the Knight-Simons Position*" [that " investment opportunities are practically unlimited "].[3]

Finally, Hicks would have cyclical fluctuations about a growth trend develop with any of a wide variety of capital–output ratios (as well as saving ratios and lags).[4] Hicks argues that any values of the accelerator above the " Upper Point " will generate a " strong " cycle when equilibrium is disturbed, values merely above the " Middle Point " will lead the system into strong cycles, and even values merely above the " Lower Point " will contribute to some (damped) cyclical fluctuations. And Hicks devotes much space in his " inspection of the ceiling " and his analysis of " the monetary factor " to a consideration of whether the forces that transform the accelerator or the desired capital–output ratios are likely to eliminate the troublesome instability and departures from full employment which the H–D–H models all suggest. Hicks' answer, of course, is not encouraging. But again, the difficulty is due to incapacities of adjustment of the monetary framework and of the economic system generally and not an arbitrary assumption of (technologically determined) corners in the production isoquants.

[1] Cf. Harrod's amplification of this point in his " Comment " on Harold Pilvin's " Full Capacity *vs.* Full Employment Growth," *The Quarterly Journal of Economics*, Vol. LXVII (November 1953), pp. 553–9.

[2] *American Economic Review*, Vol. XXXVIII (December 1948), pp. 777–94.

[3] *Ibid.*, pp. 777–9, emphasis added.

[4] J. R. Hicks, *A Contribution to the Theory of the Trade Cycle* (Oxford, 1950).

III. "A Dynamic Aggregative Model" with Some Keynesian Parameters

The issues may be fairly joined by constructing a model which draws heavily upon the elegant presentations of two of the critics, Solow and Tobin, and utilises such a model to consider conditions or assumptions sufficient to give the peculiar or particular Harrod–Domar–Hicks results. We shall consider first the factor-proportion question, assuming initially that private saving equals the change in physical capital and is some constant ratio of output. Later we shall enlarge the area of debate by introducing a more general saving function, complete with a "Pigou effect" and a new "dynamic Pigou theorem."

The Production Function, Factor Proportions and the Rate of Profit

Let us assume, with Solow and Tobin, that net output is a linear, homogeneous function of capital and labour:

$$Y = F(K,L) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

and that output consists of only one good, which may be consumed or retained as capital (invested). Writing $r = K/L$ for the capital–labour ratio, we may, on the basis of the homogeneity assumption, factor out L and rewrite the production function:

$$Y = L \cdot F(r,1) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

We may further assume diminishing marginal returns to each factor of production, throughout the economically relevant range of factor proportions, so that, in particular,

$$\frac{d^2F}{dr^2} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

But since in equilibrium the rate of profit, i, is presumed to equal the net marginal product of capital, we may write

$$i = F_K \equiv F_r \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

and, consequently, substituting in (4),

$$\frac{di}{dr} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

In words, i must be a monotonic, decreasing function of r; an increase in the capital–labour ratio must mean a decrease in the rate of profit.

Taking Harrod's system as representative for our purposes, we may express his symbols as

$$C_r = \frac{K}{Y} = r\frac{L}{Y} = \frac{r}{F(r,1)} \quad . \quad . \quad . \quad . \quad . \quad (7)$$

and

$$d^* = \frac{d(K/Y)}{dt} = \frac{dC_r}{dr} \cdot \frac{dr}{dt} \quad . \quad . \quad . \quad . \quad . \quad (8)$$

where r is the capital–labour ratio corresponding to the equilibrium capital-output ratio, C_r, and

$$\frac{dC_r}{dr} = \frac{F(r,1) - rF_r}{[F(r,1)]^2} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (9)$$

Hence, substituting in (1) and simplifying terms, and denoting $F(r,1)$ by F,

$$G_w = \left(\frac{d \log \Upsilon}{dt}\right)_w = \frac{s}{r} \cdot F - \frac{d \log r}{dt} + \frac{d \log F}{dt} \quad . \quad (10)^1$$

But since $F(r,1)$ is total output per unit of labour and rF_r is the return to capital per unit of labour, for all economically relevant values of r (where the share of capital is less than unity) we obtain from (9) the condition that

$$\frac{dC_r}{dr} > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (11)$$

or that Harrod's C_r, the capital–output ratio, varies in the same direction as the capital–labour ratio. From (8) and (11),

$$d^* \gtreqless 0 \text{ as } \frac{dr}{dt} \gtreqless 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (12)$$

or deepening depends upon an increase in the capital–labour ratio: moreover,

$$\frac{dd^*}{d\left(\frac{dr}{dt}\right)} > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (13)$$

i.e., deepening is a monotonically increasing function of the rate of change of the capital–labour ratio. Now, dismissing negative values of C_r, as

[1] Noting that

$$\frac{d \log F}{dt} = \frac{d \log \Upsilon/L}{dt} = \frac{d \log \Upsilon}{dt} - \frac{d \log L}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad (10.1)$$

we may write the actual rate of growth of output

$$\frac{d \log \Upsilon}{dt} = \frac{d \log K}{dt} - \left(\frac{d \log K}{dt} - \frac{d \log L}{dt}\right) + \frac{d \log F}{dt} \quad . \quad . \quad . \quad . \quad . \quad (10.2)$$

Since saving is presumed to be realised (whether consistent with entrepreneurial equilibrium or not),

$$\frac{s}{r} \cdot F = \frac{sL \cdot F}{K} = \frac{1}{K} \cdot \frac{dK}{dt} = \frac{d \log K}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad (10.3)$$

so that, substituting in (10.2),

$$\frac{d \log \Upsilon}{dt} = \frac{s}{r} \cdot F - \left(\frac{d \log K}{dt} - \frac{d \log L}{dt}\right) + \frac{d \log F}{dt} \quad . \quad . \quad . \quad . \quad (10.4)$$

But then, where

$$\frac{d \log K}{dt} - \frac{d \log L}{dt} = \frac{d \log r}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (10.5)$$

(10.4) becomes identical with (10): the actual rate of growth of output equals the warranted rate when the capital–labour ratio is actually changing at the rate $\frac{d \log r}{dt}$ consistent with entrepreneurial equilibrium.

economically irrelevant, and negative values of $s - d^*$ as unlikely and uninteresting in the present context, we see from (1) that

$$\frac{\partial G_w}{\partial C_r} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (14)$$

and

$$\frac{\partial G_w}{\partial d^*} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (15)$$

Then, combining (14) and (11),

$$\frac{\partial G_w}{\partial r} = \frac{\partial G_w}{\partial C_r} \cdot \frac{dC_r}{dr} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

and combining (15) and (13),

$$\frac{\partial G_w}{\partial \left(\frac{dr}{dt}\right)} = \frac{\partial G_w}{\partial d} \cdot \frac{dd^*}{d\left(\frac{dr}{dt}\right)} < 0 \quad . \quad . \quad . \quad . \quad . \quad (17)^1$$

In words again, Harrod's warranted rate of growth may be reduced by an increase in the capital–labour ratio (16) as well as by an increase in the rate of change of the capital–labour ratio (17).

But now we shall introduce some reasonable parameters into our production function. Critics of the growth models deal with functions which implicitly or explicitly (like the Cobb–Douglas illustration Solow employs) imply the assumption that the marginal net product of capital is always positive, regardless of how high the capital–labour ratio rises; barring demand problems it must always pay to invest. This, indeed, is one of the " crucial " assumptions [2] on which the growth model *critiques* rest. It embodies again

[1] These results may also be obtained directly in terms of r. Again denoting $\frac{Y}{L} = F(r,1)$ by F, we may write

$$C_r = \frac{K}{L} \cdot \frac{L}{Y} = \frac{r}{F} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16.1)$$

Then, substituting in (1),

$$G_w = (s - d^*) \frac{F}{r} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16.2)$$

The partial derivative of G_w with respect to r, assuming s and d^* constant, is then

$$\frac{\partial G_w}{\partial r} = -(s - d^*) \frac{(F - rF_r)}{r^2} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16.3)$$

As explained above in regard to (11), we may take $F - rF_r$, the relative share of labour, as positive. Hence, where

$$s - d^* = \text{constant} > 0, \frac{\partial G_w}{\partial r} < 0 \quad . \quad . \quad . \quad . \quad . \quad (16.4)$$

And the partial derivative of G_w with respect to d^*, with s and r assumed unchanged, is

$$\frac{\partial G_w}{\partial d^*} = -\frac{F}{r} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (17.1)$$

[2] Solow warns that: " A 'crucial' assumption is one on which the conclusions do depend sensitively, and it is important that crucial assumptions be reasonably realistic. When the results of a theory seem to flow specifically from a special crucial assumption, then if the assumption is dubious, the results are suspect " (*loc. cit.*, p. 65). But he charges this to the Harrod–Domar model.

the optimistic notion of unlimited investment opportunities; it should not be surprising that it yields optimistic conclusions. Let us, however, in curiously more classical vein,[1] recognise that in any given period, or with a given production function, there is a limit to the extent to which greater round-aboutness of production will pay for itself. All we are arguing is that with a given quantity of labour there is some finite amount of capital at which the diminishing *net* marginal return to capital will reach zero. With more than that amount of capital the marginal net product of capital will be negative; additional capital will not realise, and hence should not be expected to realise, sufficient returns during its life-time to pay for itself. We thus add the further description of our production function,

$$F_K \gtreqless 0 \text{ as } K \lesseqgtr K_0,\ L = L_0 \quad . \quad . \quad . \quad . \quad . \quad (18)$$

or utilising the homogeneity assumption and defining $r_0 = \frac{K_0}{L_0}$,

$$i = F_K \equiv F_r \gtreqless 0 \text{ as } r \lesseqgtr r_0 \quad . \quad . \quad . \quad . \quad . \quad (19)$$

Now the existence of r_0, a limit to the profitable extensibility of the capital–labour ratio, will prove sufficient to admit the possibility of the " H–D–H " difficulties,[2] but, if we wish to get more Keynesian, we can add a liquidity trap at say i_1, where $i_1 > 0$ and is the rate of return equal to the floor to the rate of interest. To i_1 will correspond some capital–labor ratio, say r_1, where $r_1 < r_0$ and

$$i = F_K \equiv F_r \gtreqless i_1 \text{ as } r \lesseqgtr r_1 \quad . \quad . \quad . \quad . \quad . \quad (20)$$

Hence there is an upper limit to the value of r, which may be denoted by r_0 or r_1, depending upon whether we wish to assume that the rate of (net) profit can fall to zero or only to some value above zero. Since from (16) it can be seen that G_w is a monotonically decreasing function of r, for any given values of s and d^* $\left(e.g.,\ d^* = 0 = \frac{dr}{dt}\right)$, there is then a lower limit to G_w. If this lower limit is still higher than the actual or maintainable rate of growth the economy is in for the H–D–H maladies.

But what if there is deepening, that is, d^* and $\frac{dr}{dt}$ are positive? Here we

[1] Consistently, for example, with the formulation by John M. Cassels, " On the Law of Variable Proportions," reprinted from *Explorations in Economics* in *Readings in the Theory of Income Distribution*, pp. 103–18.

[2] The simplifying assumption of linear homogeneity of the production function enables us to meet the Solow–Tobin type *critiques* on their own ground, but it is a stronger assumption than we require. The Harrod–Domar–Hicks problem may be exhibited by any production function in which, with the given (presumably exogenous) growth of labour supply and the rate of capital accumulation consistent with the saving function, the marginal net product of capital is declining, and has no non-negative lower bound.

are referring not to a *higher* but to an *increasing* capital–labour ratio. As we noted in (17), the greater the rate of increase of the capital–labour ratio, other things equal, the less the warranted rate of growth. Thus we may concede that if the warranted rate of growth is too high there is always some rate of change of factor proportions which will be sufficient to make the warranted rate of growth any necessary lower figure. We are not, however, out of the woods. For, in accordance with (6), an increasing value of r must mean a decreasing rate of profit. But since $i \geqq 0$ or $i \geqq i_1$, eventually (with $\frac{dr}{dt} > \epsilon$; $\epsilon > 0$),

$$\text{as } r \underset{\rightarrow}{\leqq} r_0 \text{ or as } r \underset{\rightarrow}{\geqq} r_1, \frac{di}{dt} \underset{\rightarrow}{\geqq} 0 \quad . \quad . \quad . \quad . \quad . \quad (21)$$

Then, writing

$$\frac{dr}{dt} = \frac{dr}{dF_r} \cdot \frac{dF_r}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (22)$$

we can see that since, as stated in (5), in equilibrium, the rate of profit equals the marginal product of capital or $i = F_r$, as

$$\frac{di}{dt}\left(= \frac{dF_r}{dt}\right) \underset{\rightarrow}{\geqq} 0, \frac{dr}{dt} \underset{\rightarrow}{\leqq} 0 \quad \text{unless } \frac{dr}{dF_r} \underset{\rightarrow}{\geqq} -\infty \quad . \quad . \quad (23)$$

and, substituting $di = dF_r$ in (22) and (22) in (8), we derive,

$$d^* = \frac{dC_r}{dr} \cdot \frac{dr}{di} \cdot \frac{di}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (24)$$

To paraphrase our equations once more, where the capital–labour ratio is increasing $\left(\frac{dr}{dt} > 0\right)$, deepening is taking place ($d^* > 0$), and then, as Harrod (among others) points out, the warranted rate of growth is reduced and thereby relief is found. But deepening ($d^* > 0$) requires a falling marginal net product of capital, and hence a falling rate of profit $\left(\frac{dF_r}{dt} = \frac{di}{dt} < 0\right)$. There is a limit to how far the rate of profit can fall, and hence, unless the marginal net product of capital falls asymptotically to this limit (so that $\frac{dr}{dF_r} \to -\infty$, the unlimited investment opportunities argument again), there is a limit to how long any given rate of deepening (any given positive value of d^*) can be maintained. Thus we should observe that the rate of deepening is curbed not only by price and money rigidities and direct institutional constraints on the rate of fall of the equilibrium rate of return on investment $\left(\frac{di}{dt}\right)$; whatever the freedom from constraints, as long as there is a lower limit to i (even if only at $i = 0$), i cannot fall fast for long without hitting bottom.

The Saving Function, Asset Preferences and "Pigou Effects"

We shall now abandon the assumption that saving equals the change in physical capital and is a constant proportion of output. We shall instead introduce the saving function,

$$\frac{dW}{dt} \equiv S = S\left(Y, i, K, \frac{M}{P}\right) \quad . \quad . \quad . \quad . \quad (25)$$

where W stands for wealth or total accumulated savings and is defined as

$$W \equiv K + \frac{M}{P} \quad . \quad . \quad . \quad . \quad . \quad . \quad (26)$$

the total of physical capital and the real value of cash balances, so that saving is defined as

$$\frac{dW}{dt} \equiv S \equiv \frac{dK}{dt} + \frac{M}{P}\left(\frac{d \log M}{dt} - \frac{d \log P}{dt}\right) \quad . \quad . \quad (26.1)^1$$

We may therefore, substituting in (10), rewrite the formulation of the warranted rate of growth as

$$G_w = \left(\frac{d \log Y}{dt}\right)_w = \frac{1}{K} \cdot S\left[L \cdot F, i, K, \frac{M}{P}\right] - \frac{M/P}{K}\left(\frac{d \log M}{dt} - \frac{d \log P}{dt}\right) - \frac{d \log r}{dt} + \frac{d \log F}{dt} \quad . \quad (27)$$

We shall assume that saving is positive (at least initially) and linear, homogeneous in income and wealth. Thus with a constant rate of profit and a constant ratio of wealth to income the saving–income ratio will likewise remain constant.[2] To the extent that the converse is true and, in particular, that the desire to save is dissipated with increasing income and wealth, our whole problem would, of course, at least ultimately, disappear. But that converse assumption has not to my knowledge been argued to be

[1] Saving is thus identically equal not to investment but to the sum of investment and the change in the Government's real, net obligation to the private sector of the economy. The definition is analogous to that used in national-income accounts, where saving is made equal to the sum of investment and the government deficit. It should be realised that, consistent with this definition, private saving equals income (after taxes) plus government transfer payments and capital gains, including the increase in the real value of cash balances, minus consumption. This formulation, in view of our concern with price flexibility, would seem superior to that usually offered (and accepted by Tobin), where saving is identified only with the change in capital stock. That formulation is, of course, identical with ours if the real value of cash balances is assumed to be fixed. But in a model including variable prices and ruling out money illusion, it seems preferable to identify the behavioural saving function as that describing the aggregate of individual additions to net worth, whatever the form in which these additions are embodied. We join Tobin in adopting the simplifying assumption that there are no bonds and that the only stores of value are physical capital and government-issued money.

[2] This would appear consistent with the statistical and theoretical work by Kuznets, Modigliani, Duesenberry, Friedman and others. Tobin's assumption that saving is zero for some positive income (*loc. cit.*, p. 104) is not appropriate for the long-run saving function which is relevant.

currently relevant, and will not be entertained. Our saving function may be further described by the following partial derivatives:

$$S_Y > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (25.1)$$

$$S_i \gtreqless 0 \quad \text{but} \cong 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad (25.2)$$

$$S_K < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (25.3)$$

and

$$S_{M/P} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (25.4)$$

With the possible exception of (25.2), in which it is assumed that the interest elasticity of saving is not sufficient to make any difference, these would not appear, in the present context at least, to be controversial. And in this context (25.2) need be disturbing only to those who stand on the original neo-classical position that the rate of interest can be expected to vary sufficiently to ensure the equality of investment demand and saving under conditions of full employment.

The form in which savings are held will be described by an asset preference function,

$$\frac{M}{P} = M(K, i, Y) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28)$$

the satisfaction of which defines a condition of portfolio balance. This function has the general specifications,

$$M_K > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28.1)$$

$$M_i < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28.2)$$

and

$$M_Y > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28.3)$$

But we shall also endow it with the Keynesian characteristic that the demand for liquidity becomes absolute as the rate of return on investment approaches some lower limit. Thus we add,

$$M_i \underset{\rightarrow}{=} -\infty \text{ as } i \underset{\rightarrow}{=} i_1, \text{ or merely, as } i \underset{\rightarrow}{=} 0 \quad . \quad . \quad . \quad (28.4)$$

since money is presumed to be a non-depreciating store of wealth, and hence

$$i \geqq i_1 \text{ or } i \geqq 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28.5)$$

Our system is now complete, and the issue can be specified as follows. Is an actual rate of growth of output equal to the solution for the warranted rate in (27) necessarily consistent (or attainable) with the full-employment conditions,

$$\begin{cases} L = L_s, \text{ the labor supply,} & (29) \\ \dfrac{d \log L}{dt} = \dfrac{d \log L_s}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . & (29.1) \end{cases}$$

and the profit maximisation or " economic " relationship

$$F_r = i \geqq i_1 \text{ or } \geqq 0 \quad . \quad . \quad . \quad . \quad . \quad (30)$$

along with the related constraints upon r and $\frac{dr}{dt}$ expressed in (19), (20) and (23)? Or we may pose the issue in perhaps more familiar guise: can we be sure of equality between the rate of change in the capital–labour ratio determined by saving and changes in labour supply and the rate of change in this ratio acceptable to entrepreneurs under the constraints of the production function and market-determined asset preferences, *i.e.*, can

$$\frac{S}{K} - \frac{M/P}{K}\left(\frac{d \log M}{dt} - \frac{d \log P}{dt}\right) - \frac{d \log L_s}{dt} = \frac{d \log r}{dt} ? \quad . \quad (31)$$

Within the framework of an analogous set of relationships,[1] it has been argued (by Tobin), "In this model, unlike those of Harrod, Hicks and others, failure of the labor supply to grow at the rate necessary for balanced growth [constant capital–labor ratio] does not mean that growth at a slower rate is impossible."[2] The rate of profit must fall, it is conceded, as the capital–labour ratio grows, and "Portfolio balance requires, therefore, that a given increment of capital be accompanied by a greater price decline than in the case of balanced growth. But there is some rate of price decline that will preserve portfolio balance, even in the extreme case of completely inelastic labor supply."

This argument, however, is clearly invalid if the "given increment of capital" would bring the marginal net product of capital below i_1 (or below zero), thus violating condition (30). Portfolio balance can then be preserved only if the price decline reduces the increment of capital (saving) sufficiently so that $F_r \geq i_1$ (or 0).

But can the static "Pigou effect" rescue us? Must there always be *some level* of prices (above zero) for which real cash balances will be so large that the supply of saving will be reduced to whatever amount is consistent with the exogenous growth of the labour force and an *economic* capital–labour ratio? For this to be true it must be made clear that our assumption that $S_{M/P} < 0$ is not sufficient.[3] As indicated by Patinkin,[4] the reduced rate

[1] In which, however, functional saving is defined as the change in capital stock (cf., footnote 1, p. 716, above) and is dependent only upon income, thus excluding the Pigou effect, but is assumed ("crucially") to be zero for some positive income producible under conditions of full employment (cf., footnote 2, p. 716, above).

[2] Tobin, *loc. cit.*, p. 107. The word "possible" in the text seems clearly to have been a misprint, and I have taken the liberty of changing it to "impossible" in my quotation.

[3] It is interesting to note that the Pigou effect, which we are here admitting, implies a curious type of money illusion to which illusion-hostile neo-classicists might wish to take exception. For an increase in the real value of cash balances makes society no wealthier in "real" terms, that is in goods. The illusion of greater wealth is accepted by private individuals in so far as they consider the balance sheet of only the private sector of the economy, and do not reckon that society is in some sense the debtor as well as the creditor of each dollar of government obligation.

[4] Don Patinkin, "Price Flexibility and Full Employment," as reprinted in American Economic Association, *Readings in Monetary Theory*, especially pp. 267–9, and *Money, Interest, and Prices* (Evanston, Illinois, 1956) p. 236.

of saving resulting from increased cash balances may involve an asymptotic relation in which the total possible effect is finite:

$$\frac{\partial^2 S}{\partial (M/P)^2} > 0 \text{ so that } S_{M/P} \to 0 \text{ as } M/P \to \infty \quad . \quad (25.5)$$

The economic plausibility of this argument is suggested by the observation that the acquisitive motive, as well as the desire to better oneself, to pass more on when one leaves this world than one had when one entered, are fundamental parts of the capitalist ethic. Who really finds that he is rich enough and ceases trying to get richer? But if society, no matter how great its wealth, will always strive to accumulate more, we can have no assurance that, even aside from expectational and other dynamic considerations,[1] the saving ratio can be made sufficiently low.[2]

But there is still a way out for the growth model critics. Under the restrictive conditions we have assumed, there must be a consistent solution for the warranted rate of growth as defined in (27)—if we do not require price stability. For with a constant nominal quantity of money, M, we can, from (25) and (26.1), write the increment of capital

$$\frac{dK}{dt} = S\left(Y, i, K, \frac{M}{P}\right) + \frac{M}{P} \cdot \frac{d \log P}{dt} \quad . \quad . \quad . \quad (32)$$

With falling prices $\frac{M}{P} \cdot \frac{d \log P}{dt}$ is, of course, negative and (at least mathematically) there is nothing to prevent this negative value from being indefinitely great, reducing $\frac{dK}{dt}$ to any necessary level, regardless of the supply of saving.

" Equilibrium " can thus be maintained by a perpetual fall in prices, in which the community " saves " by increasing the real value of cash balances. Paraphrasing somewhat Patinkin, we have a " dynamic Pigou theorem," [3] which suggests that there is some *rate of fall* of prices sufficient to satisfy the excess of the full employment desire to save over whatever investment demand may be forthcoming. The reader may estimate for himself the probability of finding expectations functions, let alone institutional flexibilities, which would make such a solution economically plausible.

[1] Of course, few to-day, in any event, would argue that the Pigou effect could be expected to maintain generally full employment in a dynamic system with the substantial fluctuations in demand which have characterised Western economies.

[2] It has been argued that underlying the portfolio balance equation is the desire of individuals (and the community) to split increments of wealth as between physical and monetary assets in order to minimise risk (Tobin, pp. 106–7). This would suggest that increments of wealth in the form of cash balances would increase the demand for physical capital, although its expected return were not thereby improved. But it can also be argued that as wealth increases, in line with the saving motives discussed above, its marginal utility approaches a positive asymptote and the hedging incentive would disappear as marginal utility became constant.

[3] Cf., Patinkin's *static* " Pigou theorem " in " Price Flexibility and Full Employment," p. 271.

Our system has been endowed explicitly with the neo-classical complements of variable factor proportions, flexible prices, cash-balance effects and a *fixed* linear, homogeneous production function (thus ruling out the employment of capital-using innovations like a *Deus ex machina* to set the plot straight). By way of summary, we shall describe the operation of this system when confronted with a rate of growth in the labour supply (ultimately Harrod's " natural rate of growth ") less than the " proper " full-employment rate warranted by the supply of saving. And by way of simplification of exposition we shall consider the case (suggested by Tobin) where the supply of labour is " completely inelastic . . . with respect to the real wage and with respect to time."

Since the rate of saving is (by hypothesis) positive, the ratio of capital to labour must increase continuously and the rate of profit must fall continuously. As the rate of profit falls the community becomes disposed to take larger and larger proportions of increments of wealth in the form of money. With a fixed stock of money, successive increments of wealth will then require successive declines in the level of prices. But as the rate of profit approaches the value of i at which M_i approaches minus infinity we find the community approaching a situation where no further increase in the stock of capital and decline in the rate of profit is consistent with portfolio balance, regardless of the decline in the price level (or alternately, increase in the quantity of money). The rate of profit cannot (in equilibrium) fall below the point of infinite elasticity of the demand for money because the community stops accepting further increases in capital (which is what lowers the value of i) as i reaches that lower limit. But this means that positive saving can take place only in the form of the increased cash balances stemming from falling prices. And it is only thus that the relatively too large (positive) warranted rate of growth is reducible to equality with the natural rate.

There is no assurance that such a solution, of perpetually falling prices, would prove dynamically stable when we admit the role of expectations. For price declines generating expectations of further price declines would increase the relative attractiveness of money as compared to physical capital, and might leave no point of equilibrium as long as there were physical capital of which individuals might dispose. I shall not attempt to explore further the difficulties along these lines, but, in any event, it is on this solution of perpetually *falling* prices—a " dynamic Pigou theorem "—that a rejection of the *possibility* of the growth model problems would have to rest.

IV. Conclusion

The implications of recent models of economic growth and fluctuation of the Harrod–Domar–Hicks variety have been challenged as the consequence of arbitrary assumptions of rigid technological relationships and/or rigid price relationships. This challenge is unfounded.

For the Harrod–Domar–Hicks models require no more in the way of a production function than most of us would be willing to grant as reasonable. Specifically, they do require a schedule of *net* marginal productivity of capital declining in such a way that there is a limit to the capital–labour (or capital–output) ratio which is economically feasible. This limit may be reached at the point where the marginal efficiency of investment equals the rate of interest set by the Keynesian liquidity trap. It may even be reached only at the point where the marginal net product of capital is zero (and the marginal efficiency of investment also zero if expectations are founded on reality). But limit there must be.

And if there must be an *upper* limit to the capital–output ratio, there must, for any saving ratio, be a *lower* limit to the rate of growth of output (or labour) which will be consistent with the saving forthcoming. This minimum "required" rate of growth can then be reduced only to the extent the saving ratio can be reduced. If the saving ratio will not adjust automatically, via interest-rate changes or "Pigou effects," to whatever value is consistent with whatever rate of growth of output obtains, then there remains some minimum "warranted," "equilibrium" or "full-employment" rate of growth. This rate of growth is thus determined jointly by the upper limit to the automatic, free adjustment of the capital–output ratio and the lower limit to the automatic free adjustment of the saving ratio. If we do not obtain this rate of growth we are in some kind of trouble—an underemployment trouble which the models merely seek to explain, not create.

We are not always in this kind of trouble. We may not always face a problem of capital–output ratios and saving ratios determined by free economic forces being inconsistent with underlying determinants of economic growth such as population and the development of additional natural resources. The problem may become remote for substantial periods of time because of various social or governmental pressures (intended or unintended) upon these ratios. But whether or not the problem is at any moment of time crying for solution, it does exist. And in view of the historical record of cyclical instability, uneven growth and recurring periods of unemployment in the (private-profit-motivated) capitalistic economies we have known, the problem seems important. It is perhaps a mark of the technological backwardness of economic theory that the "H–D–H dynamic" arrived so late. It will certainly (in the view of this observer) be a mistake to hasten to discard it.

ROBERT EISNER

Northwestern University.
Evanston.

CONCENTRATION OF EXPORTS AND IMPORTS: AN INTERNATIONAL COMPARISON[1]

THE major purpose of this study is to examine the commodity concentration of exports and imports of as many countries as possible, and thus to indicate the degree to which the economic fortune of a country is dependent upon one or a few goods. This measure has bearing on many aspects of the country's economic position, some of which will be mentioned in the present paper. The method employed in the measurement of concentration will be explained in the first section. In the following section the results will be expounded and, in particular, attention will be drawn to the implications of the findings for the well-known controversy over the effect of a devaluation on the terms of trade of the devaluing country. In the third and last section the study will be carried somewhat further by the measurement of the geographic concentration of exports and imports; that is, the concentration of each country's trade according to its distribution among countries, rather than among commodities.

I

Defining the " commodities " involved is the first, and probably crucial, step in measuring the degree of commodity concentration of exports and imports by commodities. The results obtained by different definitions may differ not only in their magnitudes but also in their signs. Whatever classification of commodities is adopted, it is essential that it should be consistently applied to both exports and imports. Likewise, if we are to make meaningful international comparisons, the same classification must be used throughout.

Fortunately, this can be done at present, owing to the increasing use of the Standard International Trade Classification (SITC) in reporting international trade figures. This use is urged by the United Nations, and in the 1955 volume of the United Nations *Yearbook of International Trade*, the trade of sixty-eight countries and territories is recorded according to the SITC. The present study is based on this material.

Selecting the method of classification does not in itself solve the problem of definition. It remains to decide in what detail and fineness should " commodities " be defined. In the SITC, commodities are classified into 10 *sections* (one-digit code), 52 *divisions* (two-digit code), 150 *groups* (three-digit code) and 570 *items* (five-digit code). From a practical point of view, it would be very inconvenient to select, for our purposes, the five-digit code, both because the readily accessible data would not permit it and because

[1] I am indebted to Professors Simon Kuznets, Fritz Machlup and Don Patinkin for searching criticism and numerous suggestions, and to Mr. Dov Genichovsky for extensive assistance in calculations.

the amount of work involved in calculation would be too great. But practical considerations aside, it still seems justifiable to select the three-digit code. If fineness in classification is carried beyond this, commodities that are very close substitutes in consumption or production, or both, would be defined as separate goods, and exports or imports that are quite homogeneous, for the purpose of this study, would appear as heterogeneous. On the other hand, if the one-digit or two-digit code is adopted, so that commodities are classified into just ten sections, or fifty-two divisions, goods that are distinctly apart from each other would be grouped together, so that our comparisons would not be very meaningful. Hence it was decided to use the three-digit code and to make the comparison for those countries only, among the fore-mentioned sixty-eight, whose statistics are recorded in this form. Forty-four such countries and territories are found in the 1955 volume of the *Yearbook*. Where information was available, figures for 1954 were taken; otherwise, 1953 and, in very few cases, 1952 figures were used.[1]

The degree of concentration is measured by the Gini coefficient of concentration.[2] If there are n export goods, the annual value of exports of any good i is x_i, and the annual value of total exports is X, the coefficient of concentration of exports will be

$$\sqrt{\sum_{1}^{n}\left(\frac{x_i}{X}\right)^2}$$

and likewise for imports. For convenience, this is multiplied by 100. Obviously, the highest possible coefficient is 100, where all exports consist of a single good. The lowest possible coefficient is $\frac{100}{\sqrt{n}}$. In our case—where $n = 150$—this coefficient would be about 8·2, and represents the case in which the country's exports are equally divided among all groups.

Before presenting and interpreting the coefficients obtained, some shortcomings of the method should probably be pointed out. The most serious among these is that fact that, once commodities have been defined, they are regarded as equally different from each other, although some are close substitutes while others are bad substitutes. That this may be a severe deficiency may perhaps be best visualised by looking at a specific country. Take, for instance, Finland, whose exports are overwhelmingly composed

[1] The main work for this study was carried before the 1955 volume of the *Yearbook* became available, and hence is based on that for 1954. The later volume was then used to add four countries to the forty for which information had already appeared in the 1954 volume. I strongly believe that, in practically all countries, changing the year, the record of which serves as basis for calculations, would call forth only minor changes in the numerical magnitudes of the coefficients of concentration, and that the results obtained on the basis of any single recent year indicate the fundamental present-day structure of trade of the country concerned.

[2] This method was also used by Albert O. Hirschman, *National Power and the Structure of Foreign Trade* (Berkeley and Los Angeles: University of California Press, 1945), Chapter VI. Hirschman measured the geographic concentration of trade, not the commodity concentration. We shall refer further to Hirschman's study in Section III.

of wood and paper products. These do not appear as one group, but as several,[1] among which Finland's exports are distributed quite evenly. Finnish exports thus appear not to be particularly concentrated, and the coefficient of commodity concentration of exports is as low for Finland as it is for other countries whose exports are, in fact, much more heterogeneous, in the sense that they consist of goods that are much less substitutable for each other. This deficiency is not, of course, the fault of SITC, since it would persist in any form of classification. It might have been possible to overcome it by assigning " distances " between any pair of commodities (say, according to their cross-elasticities of demand), and taking them into account in formulating the coefficients. In practice, however, this procedure does not seem feasible.

Another point to be noted is that certain groups are of the catch-all, *i.e.*, the " n.e.s." (not enumerated separately) type, and often these groups are large. Moreover, they are more important in the industrial sections, and may thus form a bias towards a higher degree of concentration where exports or imports are largely industrial. It seems, however, that in no single case is this shortcoming important enough to detract from the meaningfulness of the results.

Likewise, it should be remarked that the *Yearbook* statistics refer only to trade in goods, and not in services. Again, for most countries this does not seem to be a severe handicap, since trade in services is usually small, compared with the amount of trade in goods. In some countries, however, where exports of services are relatively substantial,[2] and where they consist of very few items (such as, for instance, shipping in Norway), the coefficients of commodity concentration might have been materially different had services been included.

Finally, it is the intention of the study to draw conclusions applicable to the world as a whole, although it covers less than half of the world's countries and territories. Since, however, the trade of the countries investigated comprises some 80% of world trade, this procedure seems legitimate. Moreover, although these countries were not picked at random, they seem to include economies of almost all types and shades.[3] I believe, therefore, that inferences drawn from this study apply, with probably minor qualifications, to the world at large.

II

The coefficients of concentration of exports and of imports, and the ratio between the former and the latter, are presented in Table I in descending order of the exports' coefficient.

[1] Such as " wood, round or roughly squared," " wood, shaped or simply worked," " plywood, boards, etc.," " paper and paperboard," " pulp and waste paper."

[2] This is less frequent with regard to imports, partly because imports of goods are usually recorded on c.i.f. basis.

[3] Most conspicuous in their absence are countries in the Soviet orbit, whose trade structure may not be similar, on the average, to that of countries covered in this study.

TABLE I

Coefficients of Commodity Concentration of Exports and Imports

Country.	Exports.	Imports.	$\frac{\text{Exports}}{\text{Imports}}$
1. Mauritius	98·8	28·6	3·46
2. Netherlands Antilles	93·7	83·0	1·13
3. Egypt	84·2	18·6	4·54
4. Colombia	84·0	23·9	3·51
5. Gold Coast	83·5	21·4	3·89
6. Iceland	80·3	19·1	4·21
7. Burma	74·4	24·2	3·08
8. Trinidad and Tobago	72·7	30·5	2·39
9. Thailand	68·3	21·4	3·19
10. Honduras	65·0	19·7	3·30
11. Panama	62·8	16·8	3·74
12. Brazil	61·2	23·2	2·64
13. Costa Rica	60·5	18·8	3·21
14. Australia	50·8	27·0	1·88
15. Malaya and Singapore	49·8	25·4	1·96
16. Nigeria	49·3	24·3	2·03
17. Kenya–Uganda	49·0	22·9	2·14
18. Greece	46·2	19·3	2·40
19. Tanganyika	44·6	22·8	1·95
20. Indonesia	41·7	24·5	1·70
21. Turkey	39·7	23·5	1·69
22. Ireland	38·3	16·5	2·31
23. Finland	38·1	19·2	1·98
24. Mexico	35·0	26·8	1·30
25. Libya	34·1	18·9	1·80
26. Spain	33·9	24·5	1·39
27. Rhodesia and Nyasaland	32·5	20·2	1·61
28. Argentina	30·6	21·5	1·42
29. Sweden	28·1	18·5	1·52
30. Austria	27·7	19·7	1·41
31. Denmark	27·1	18·5	1·46
32. Belgium–Luxembourg	25·5	15·5	1·65
33. Norway	25·5	23·4	1·09
34. Canada	24·9	18·0	1·38
35. Japan	24·8	26·4	0·94
36. Portugal	24·7	19·1	1·30
37. Germany (Federal Republic)	22·3	15·6	1·43
38. Yugoslavia	21·4	26·1	0·82
39. Hong Kong	20·6	16·0	1·28
40. Italy	20·5	20·7	0·99
41. United Kingdom	19·2	16·1	1·19
42. United States	18·8	20·5	0·92
43. France	18·0	20·4	0·88
44. Netherlands	16·9	16·0	1·06

The findings of Table I are relevant to the lively—and yet unsettled—discussion of the probable effect of devaluation on the terms of trade of the devaluing country.[1] Let us recall Joan Robinson's well-known statement:

> " In general, each country is more specialised in respect to the goods which it produces than in respect to the goods which it consumes, so that any one country plays a more dominant role in the world supply

[1] For some of the positions taken in this controversy, see Fritz Machlup, " The Terms-of-Trade Effects of Devaluation upon Real Income and the Balance of Trade," *Kyklos*, Vol. IX (Fasc. 4, 1956), pp. 417–52.

> of those goods which it exports than it plays in the world market for those goods which it imports. In general, therefore, the world demand for the exports of one country is less elastic than the world supply to it of those goods which it imports. So far as the foreign elasticities are concerned, there is thus a strong presumption that a fall in the exchange rate will turn the terms of trade in the unfavourable direction." [1]

The logic of this statement is that production of internationally traded goods is distributed among many countries, each of which specialises in a few industries to which it is best fitted. At the same time, it purchases a large variety of goods from abroad, in the market for each of which the country is one customer among many and thus not very significant.

This view has not gone completely unchallenged. Hinshaw [2] thought that " in the case of a large country, there is the presumption, in the absence of knowledge to the contrary, that the country is as important an influence in the world demand for the internationally traded goods that it buys as in the world supply of the goods that it sells." Specifically, Hinshaw thought that Joan Robinson's statement was not applicable to the United States and other major industrial countries, such as the United Kingdom and most of the Western European countries.

I do not intend to inquire here whether Joan Robinson's presumption about commodity concentration of exports and imports should lead to her conclusion about the effect of devaluation on the terms of trade; I rather intend to verify the presumption itself. From Table I we learn that in the large majority of countries exports are indeed more concentrated than imports. This is true for thirty-nine out of the forty-four countries under investigation. The (unweighted) arithmetical average of the ratio between the coefficients is approximately 2.

Joan Robinson's presumption seems, thus, to be valid. Yet, Hinshaw's position is not entirely refuted. In the United States, as Hinshaw suspected, exports are more diversified than imports (partly due to the large share of a

[1] Joan Robinson, " Beggar-My-Neighbour Remedies for Unemployment," *Essays in the Theory of Employment*, 2nd ed., reprinted in *Readings in the Theory of International Trade* (Philadelphia: The Blakiston Company, 1949), pp. 393–407. Quotation from p. 400.

Symbolically (using notation different from Joan Robinson's), the terms of trade of the devaluing country would deteriorate, under certain specified assumptions, if $\frac{\epsilon_I}{\eta_x} > \frac{\eta_I}{\epsilon_x}$, where

- ϵ_I is the elasticity of foreign supply of imports;
- η_x is the elasticity of foreign demand for exports;
- η_I is the elasticity of domestic demand for imports;
- ϵ_x is the elasticity of domestic supply of exports.

Joan Robinson submits that, owing to the difference in commodity concentration of exports and imports, the left-hand term of the inequality is high, or at least above unity; while the right-hand term is usually, particularly in slump conditions, below unity, and only in exceptional cases would it be so much above unity as to be greater than the left-hand term. Hence the probable outcome of a devaluation would be a deterioration of the terms of trade of the devaluing country.

[2] Randall Hinshaw, " Currency Appreciation as an Anti-inflationary Device," *Quarterly Journal of Economics*, Vol. LXV (November 1951), pp. 447–62.

single commodity, coffee, in the United States' imports). The same holds for two Western European countries, France and Italy, as well as for Japan and Yugoslavia. In the Netherlands imports are practically as concentrated as exports, and this applies to a lesser extent also to the United Kingdom and to Norway. Although these countries are, numerically, in the minority, it must be noted that their currencies include most of the world's major currencies, and that they occupy a large share of the international trade; their combined trade amounted, in 1954, to some 43% of world trade, and about 55% of total trade of the countries covered by this study.

One should be careful not to identify a high degree of concentration of exports with a low elasticity of foreign demand for exports. The degree of concentration is but one factor. Another is, of course, the nature of the goods in which the country specialises; and, it may be noted, countries whose exports are by and large highly concentrated export commodities the demand for which is believed to be inelastic—an added reason for inelasticity of foreign demand for the exports of these countries. Still another factor is the share of the country in world trade, and the degree to which the country's major export goods are produced abroad. Compare, for instance, Colombia with Brazil. The former's exports are much more concentrated than the latter's. Yet Colombia undoubtedly faces a more elastic demand for its major export good, coffee, than Brazil, whose share among the suppliers of coffee is dominant. On the other hand, consider a country like Turkey. It is about an average country, as far as the concentration of its exports is concerned, and its share in total world exports is rather small (some 0·5%). But Turkey is virtually the sole exporter of one of its major export goods, raisins, and is a very significant exporter of Oriental tobacco, another important export good, so that it is not at all clear whether the demand for Turkey's exports is indeed elastic.

It should be noted that the countries with the most predominant shares of world trade are also, by and large, the countries whose exports are least concentrated. Thus, two opposing factors work on the elasticity of demand for their exports.[1] It is important to know, in this context, not only the share of a country's exports in *world* trade; owing to transportation costs, artificial barriers and general imperfections of markets, the actual " market " whose demand concerns any country is usually considerably less than the whole

[1] These two factors together determine the " weight " of a country in world exports. Symbolically, the index of the country's " weight " is

$$\sum_i \left[\frac{x_{ij}}{x_i} \cdot \frac{x_{ij}}{x_j}\right]$$

where x_{ij} stands for exports of commodity i by country j, x_i stands for world exports of commodity i, and x_j for total exports of country j. This index would be higher the more concentrated the country's exports, and the larger the share of each of its export commodities in total world exports of that commodity. Our coefficient of concentration and the index of " weight " are, of course, different—though related—concepts. A separate study of the " weight " of countries in world trade will follow the present study.

world. The degree of geographic concentration of the country's exports (which will be examined in the next section) is thus also an important factor which affects the elasticity of demand for the country's exports.

A few other conclusions of interest may be deduced from Table I. We note that there is a much larger variation among countries with regard to the degree of commodity concentration of exports than with regard to the commodity concentration of imports. Coefficients of concentration of exports range all the way from 16·9 to 98·8 (the maximum possible range for both exports and imports, to be reminded, is from 8·2 to 100). The respective range for imports is, with one exception (the territory of the Netherlands Antilles), only from 15·6 to 30·5. Whether the ratio between the coefficients of commodity concentration of exports and imports is high or low is determined primarily by the former and not by the latter.

Let us now suggest some possible causes of variation with regard to commodity concentration of exports. What similarities can one find among countries whose exports are more (or less) concentrated? One answer that immediately suggests itself is that, by and large, the more developed the economy (that is, the higher its *per-capita* income), the more diversified are its exports. This could be expected, since a higher degree of economic development is usually associated with a more varied production.

Further, and this point is closely related to the former, although conceptually separate, it may be seen that the more industrialised the economy (that is, the lower the share of primary production in its national product), the more diversified are its exports. It may not be easy to distinguish between the "industrialised" and the "developed" economies, since the more industrialised countries are usually the more developed as well. Among the few exceptions that may be found, the most conspicuous are Australia, on the one hand, a country with an important agricultural sector whose exports are rather concentrated despite its very high level of *per-capita* income; and Japan, on the other hand, whose developed industry may explain the fact that her exports are highly diversified, although its *per-capita* income is low. The major export items in countries whose exports are highly concentrated are always primary goods (such as sugar in Mauritius, oil in the Netherlands Antilles, cotton in Egypt, coffee in Colombia or cocoa in the Gold Coast—to mention only five countries with the highest coefficients of commodity concentration). Where exports are highly diversified, they consist largely, in most cases, of manufactured goods.

Another suggestion, again related to the previous two, is the following: The greater is the geographical proximity of the country to centres of world trade, the more diversified are its exports. It is most striking, for instance, that almost all the countries whose exports are highly diversified are in Europe (that is, lie within the world's major trading area), while no European country has highly concentrated exports. It might be objected that this is no valid argument, since it so happens that the European countries are,

by and large, the more developed ones. Let us confine the comparison, then, to two groups of approximately the same level of development (*i.e.*, of *per-capita* income). The European group consists of six countries, whose (1954) *per-capita* annual incomes range from U.S.$200 to 410, and whose (unweighted) average *per-capita* income is about U.S.$300; the non-European group consists of seven countries, whose *per-capita* incomes are between U.S.$210 and 460, with an average income of about U.S.$275 for the group. We find that the average coefficients of commodity concentration of exports are 31·7 for the European group and 51·9 for the non-European group. That distance should be a factor could be expected, since the less important the transportation costs, the larger is the number of goods which the country is able to export.

It has sometimes been suggested that the *size* of the economy should also be considered. The larger is the country, the more varied should its production be, since the more varied, it may be presumed, are its climatic regions, its natural resources and, probably, its human resources. Moreover, a great number of industries cannot, owing to internal and external economies, be maintained in small countries. This is emphasised by Kuznets,[1] who suggests that economic activities would be more diversified in the larger country even if we compared two underdeveloped countries, but "the contrast in diversification would be particularly conspicuous for two economically advanced nations." And it is reasonable to assume that a larger variety in production would be reflected in higher diversification of exports.

TABLE II

Coefficients of Commodity Concentration of Exports, by Size and by Degree of Development

	Developed countries.	Underdeveloped countries.	Total.
Large countries	21·4	57·8	40·7
Small countries	39·1	46·2	41·5
Total	31·2	53·7	41·1

Our findings seem to support the main contention of this thesis. Table II presents the average coefficients of concentration of exports of those countries, thirty-four in number, for which estimates of *per-capita* income are available.[2]

[1] Simon Kuznets, "Economic Growth of Small Nations" in *The Challenge of Development*. (The Eliezer Kaplan School of Economics and Social Sciences, The Hebrew University, Jerusalem, 1958.)

[2] "Developed country" is defined arbitrarily as a country whose *per-capita* annual income exceeds U.S.$300 (according to the figures of the United Nations' *Per Capita National Product of Fifty-five Countries: 1952–1954*). "Small country" is defined, following Kuznets, as one whose population numbers less than 10 millions. This means, of course, that the country's area is not part of the definition, although there is certainly a close correlation between area and the size of population.

Table II shows that among the more developed countries, exports are indeed much more concentrated in the small than in the large countries. This is not true among underdeveloped countries; on the contrary, in this group exports are more concentrated in the large countries. It may be inferred that among underdeveloped countries the effect of size is relatively unimportant, and is overcome by other factors; one of these may be the fact that out of five countries in the group of " small countries," two (Greece and Portugal) are in Europe, while all seven large countries are non-European.

Is there, in general, any observable relation between the commodity concentration of exports and imports in any single country? It might be expected that the more concentrated the exports, the more diversified will imports be, since a high concentration of exports indicates a high degree of specialisation in production, which means, in turn, that a large variety of goods ought to be imported. We find, however, that as a rule the opposite is true; a positive correlation exists between concentration of exports and imports, though there are many exceptions to this rule. This is most evident if we average out groups of countries and if, in particular, we compare the group of (say) the ten countries whose exports are most concentrated with the group of ten countries whose exports are most diversified. The coefficient of correlation between the degree of commodity concentration of exports and imports for the forty-four countries is 0·43, and the coefficient of rank correlation between the two is also about 0·4. I can see primarily three reasons for this positive correlation.

The exports of a country may be the result of fabrication of imported raw materials, and a high commodity concentration of exports may be then the direct cause of a high commodity concentration of imports. One has in mind, for instance, the British export of textiles and its bearing upon the import of wool. Yet, in the case of the United Kingdom as well as in almost all other cases, a casual examination of the structure of trade suggests that this direct relation between concentration of exports and imports is not very important. Only in one case can it be said with assurance that this relation is a major factor: in the Netherlands Antilles exports consist almost entirely of petroleum products, while imports are overwhelmingly composed of crude and partly refined petroleum.

It is much more plausible that concentration of exports is not the cause of concentration of imports, but that there are certain common factors which affect both exports and imports. One is the aforementioned distance of the country from major trading areas. The heavier the transportation costs, in the country's international trade, the larger is the range of " domestic " commodities in its economy, and the smaller are the ranges of both export and import goods. A proper example for the operation of this factor may be the comparison of Australia and Canada, countries which are similar in many respects. In Australia, both exports and imports have

high coefficients of commodity concentration. In Canada, on the other hand, whose centres of production and consumption lie close to the United States' major markets (and where, it should be added, certain other barriers to movements of goods, such as different languages, different trading customs, etc., are virtually non-existent), both exports and imports are diversified.[1]

Finally, the most important factor seems to be the level of economic development. It was seen that the less-developed countries tend to have concentrated exports, composed of one or very few staple or extractive goods. But the low level of development (*i.e.*, of *per-capita* income) implies not only a lower level of consumption *per capita*, but involves also a less varied consumption. Indeed, a generation or two ago one would have found, probably, a still higher degree of concentration of imports in underdeveloped countries. At present, imports of these countries are more diversified than they probably were, because the effort of economic development, particularly industrial development, requires the importation of a large variety of capital goods.

III

The investigation of the geographic concentration of trade, with which the present section will be concerned, is based on the 1954 data of the *Direction of International Trade*.[2] While for certain purposes one might be interested in the distribution of trade not among all countries and territories but rather among independent countries only, or even among monetary areas, for our purposes it seems best to treat each country and territory which is listed separately, whether independent or not, as a separate political unit.[3] The investigation is confined to the same countries whose commodity concentration of trade has been examined in the previous sections. For two of these countries, Kenya–Uganda and Libya, no information on the direction of trade is available, so that the study covers forty-two countries and territories. The coefficients of geographical con-

[1] Actually, one should consider not only convenience of transportation, in the narrow sense, but also other factors that hinder the mobility of goods, including man-made barriers such as customs duties, etc. It is reasonable to assume that the higher these obstacles to mobility, the more concentrated would exports and imports be. This point cannot be verified, however, without a wide research that is beyond the scope of the present study.

[2] A joint publication of the Statistical Office of the United Nations, the International Monetary Fund and the International Bank for Reconstruction and Development.

[3] One difficulty arises by the fact that not all the "units" consist of single countries or territories; some are groups such as "special categories," "other British countries," "other areas (in Asia, Africa, etc.)" and the like. Wherever such a group is of minor importance it is considered, indeed, as a separate single unit, with no justification but with very little harm done. Where, on the other hand, a group of this nature amounts to more than a small percentage of exports or imports, it is excluded from the calculations altogether.

centration of exports and imports are presented in Table III, in descending order of the former.

TABLE III

Coefficients of Geographic Concentration of Exports and Imports

Country.	Exports.	Imports.	Exports / Imports
1. Panama	95·5	67·0	1·43
2. Ireland	89·7	56·7	1·58
3. Colombia	79·8	64·2	1·24
4. Honduras	78·0	69·4	1·12
5. Mauritius	77·6	46·5	1·67
6. Nigeria	74·0	51·3	1·44
7. Mexico	73·7	81·2	0·91
8. Canada	63·9	74·9	0·85
9. Costa Rica	62·4	60·4	1·03
10. Rhodesia and Nyasaland	58·4	55·5	1·05
11. Trinidad and Tobago	50·0	47·5	1·05
12. Gold Coast	47·9	50·5	0·95
13. Burma	47·6	39·6	1·20
14. Thailand	43·5	35·7	1·22
15. Denmark	41·8	37·0	1·13
16. Brazil	41·5	37·4	1·11
17. Australia	41·2	49·5	0·83
18. Tanganyika	39·5	47·2	0·84
19. Indonesia	38·3	31·4	1·22
20. Greece	34·1	31·1	1·10
21. Finland	34·0	26·8	1·27
22. Netherlands Antilles	33·6	79·7	0·42
23. Argentina	32·1	26·8	1·20
24. Austria	31·8	39·7	0·80
25. Yugoslavia	31·3	37·0	0·85
26. Spain	29·5	28·4	1·04
27. Belgium–Luxembourg	29·4	28·6	1·03
28. Turkey	29·3	28·4	1·03
29. Iceland	29·1	30·8	0·95
30. Sweden	28·4	30·4	0·93
31. Norway	28·0	25·9	1·08
32. Hong Kong	27·6	30·0	0·92
33. United States	27·5	27·6	0·99
34. Portugal	27·4	28·0	0·98
35. Netherlands	27·0	29·6	0·91
36. Malaya and Singapore	26·0	38·2	0·68
37. Egypt	26·0	26·0	1·00
38. Japan	24·0	38·1	0·63
39. France	21·8	20·4	1·07
40. Italy	21·1	24·2	0·87
41. Germany	21·0	20·8	1·01
42. United Kingdom	18·7	19·4	0·96

In interpreting the results of our examination, it is convenient to follow, in part, the pioneering work of Hirschman,[1] who calculated the coefficients of geographic concentration of trade of forty-five countries,[2] for several

[1] Albert O. Hirschman, *National Power and the Structure of Foreign Trade, op. cit.*

[2] Hirschman's calculations were confined to "small" countries; his definition of "small" countries is different, however, from the one used in the present study, and covers even countries such as Brazil or Poland. In addition to forty-four small countries the United Kingdom was studied by Hirschman, for the sake of comparison.

years for the period 1913–38. Two of Hirschman's conclusions may be of interest in the present context:

(*a*) Exports tend to be more geographically concentrated than imports. In only six countries out of the forty-five did Hirschman find the opposite to be generally true, and in sixteen others the geographic concentration of exports and imports tended to be of approximately the same strength. The tendency of exports to be more geographically concentrated than imports was particularly recognisable in countries in which the geographic concentration of foreign trade was high.

(*b*) The geographic concentration of exports is stronger the stronger the commodity concentration of exports. Although Hirschman did not study the latter concentration, he believed that our general knowledge of the structure of exports of the countries involved warranted this proposition.

Hirschman's first conclusion is barely reaffirmed by the present study. Of the forty-two countries examined, twenty-three have higher geographic concentration of exports than of imports, in eighteen the opposite is true, and in one country exports and imports are equally concentrated. Put differently: in twenty countries the ratio between the coefficients of geographic concentration of exports and imports is between 0·9 and 1·1, that is, the two coefficients are fairly similar; in nine others the ratio is below 0·9, while in thirteen countries it is above 1·1. The average ratio is about 1·04. It may thus be concluded that, although exports tend to be somewhat more geographically concentrated than imports, the difference is so slight that it is perhaps not meaningful.

It is still true that the tendency of exports to be more geographically concentrated than imports is stronger in countries with high geographic concentration of trade, but this, too, is less conspicuous in the present study than in Hirschman's. If we define a country in which either exports or imports have a coefficient of geographic concentration higher than 40 as a country whose trade is highly concentrated, we find that of nineteen such countries, in five the ratio between the coefficients of geographic concentration of exports and imports is between 0·9 and 1·1, in four it is below 0·9, and in ten it is above 1·1. The average ratio is 1·11.

The difference between the indications of the present study and those of Hirschman's may partly be due to the fact that the countries under investigation were not the same in the two studies. Yet, the difference persists if we confine our attention to those countries only that are common to both studies. For twenty-two of the countries examined in the present study information for the years 1937 and 1938 (as well as for several other

years) is provided by Hirschman's research. The average coefficients of geographic concentration of this group are as follows:

TABLE IV

Coefficients of Geographic Concentration of Twenty-two Countries, 1937–54

	1937.	1938.*	1954.
(1) Exports	43·4	46·9	41·3
(2) Imports	40·4	41·7	39·5
(3) Ratio (1)/(2) . . .	1·09	1·12	1·04

* Twenty-one countries only.

It is clear that the difference between geographic concentration of exports and imports was narrower in 1954 than before the Second World War. This seems, from Table IV, to have been achieved by a considerable decline of concentration of exports.

Hirschman's second hypothesis—that the higher the commodity concentration of exports, the stronger is their geographic concentration—is borne out by the present study. The positive correlation between the two forms of concentration becomes clear if we average out large groups. If, for instance, the forty-two countries are divided into three groups of fourteen countries each, according to the strength of commodity concentration of their exports, the average coefficient of geographic concentration of exports would be 60·9 for the upper group, 44·2 for the next one and 29·3 for the last group. The coefficient of the rank correlation between the strength of the two forms of concentration of exports is, for the forty-two countries, approximately 0·6.

This positive correlation is somewhat bewildering. As Hirschman pointed out correctly, one might have expected the correlation to be negative; a country which exports but a few commodities would be forced, it may be presumed, to distribute her exports among many customers—and vice versa. Indeed, Table III provides several examples, such as Egypt, on the one hand, and Canada, on the other hand, where this reasoning seems to be justified. Yet, again, in general the opposite is true.

Hirschman explains this phenomenon by the suggestion that as a country becomes more industrialised (which, as we have seen, means as a rule that the commodity diversification of its exports becomes higher), it widens its trade connections; it acquires new customers while retaining her former ones. I suggest that an additional explanation lies in the geographic position of the countries involved. As may be remembered from Table I, almost all the countries the commodity diversification of whose exports is high are European countries. A large, sometimes overwhelming part of their exports, is marketed in Europe. But Europe, of course, consists of numerous countries, most of which are important traders. Where, on the other hand, a major trade area consists of a single country—namely, the

United States—we find that the trade of countries located nearby is strongly concentrated, even if these countries are highly developed, such as Canada.

It is interesting to inquire, once again, what is the effect of *size* on the geographic concentration of exports. On the one hand, it could be expected, as Hirschman pointed out, that since exports of a small country form only a minor part of world exports, they may be absorbed by one or a very few countries. On the other hand, it has been seen earlier that among the developed countries, commodity concentration of exports of small nations tends to be higher, which may force a wider distribution of these exports among customers.

Our figures indicate that the former factor is dominant. Exports of small countries are more geographically concentrated than exports of large countries; this is true both for developed and underdeveloped countries, as may be seen from Table V.

TABLE V

Coefficients of Geographic Concentration of Exports, by Size and by Degree of Development

	Developed countries.*	Underdeveloped countries.	Total.
Large countries *	29·1	45·7	37·4
Small countries	37·9	58·7	44·9
Total	34·0	50·7	41·0

* For the definition of "developed" and "large," see Table II.

TABLE VI

Largest Customer and Largest Supplier of Countries with Highly Concentrated Trade *

Country.	Largest customer.	Largest supplier.
Panama	United States	United States
Ireland	United Kingdom	United Kingdom
Colombia	United States	United States
Honduras	United States	United States
Mauritius	United Kingdom	United Kingdom
Nigeria	United Kingdom	United Kingdom
Mexico	United States	United States
Canada	United States	United States
Costa Rica	United States	United States
Rhodesia and Nyasaland	United Kingdom	United Kingdom
Trinidad and Tobago	United Kingdom	United Kingdom
Gold Coast	United Kingdom	United Kingdom
Burma	India	United Kingdom
Thailand	Malaya	Japan
Denmark	United Kingdom	United Kingdom
Brazil	United States	United States
Australia	United Kingdom	United Kingdom
Tanganyika	United Kingdom	United Kingdom
Netherlands Antilles	United States	Venezuela

* Countries with "highly concentrated" trade have been defined, as before, as those countries whose coefficients of geographic concentration of exports and/or imports are above 40. Countries are arranged by decreasing order of their coefficient of geographic concentration of exports.

Finally, it is worthwhile to pay attention to the extraordinary position of the two largest trading nations, the United States and the United Kingdom. On the one hand, the latter has the least, and the former one of the least, geographically concentrated trade. On the other hand, one of these two countries is the major customer and supplier of almost all countries whose trade is highly concentrated. This is shown in Table VI.

It should be noted that trading ties of countries whose trade is highly concentrated with the United States or the United Kingdom are not of the one-way nature: for almost all these countries, one can see an identity of the major customer with the major supplier—an outstanding phenomenon particularly in view of the fact that both the U.S. dollar and, for most commercial transactions, sterling are convertible currencies.

MICHAEL MICHAELY

The Eliezer Kaplan School of Economics and Social Sciences,
The Hebrew University,
Jerusalem.

INFLATION, THE TERMS OF TRADE AND THE SHARE OF WAGES IN NATIONAL INCOME

In a long section devoted to Income Distribution the recent U.N. Survey of Europe [1] draws attention to changes in the relative shares of different factors of production in the national incomes of selected European countries. It appears that the share of wages in most countries has risen very considerably since before the War, but this rise does not seem to have been at the expense of profits or even of income from self-employment. The almost universal use of some form of rent control seems to have been the important factor which "has ensured that rental incomes have kept pace neither with the rise in prices since before the War nor with the rise in other incomes." [2] In later post-war years rents have been partially derestricted, and in consequence the share of rent has somewhat recovered.

Taking the period from 1948 on, there has been little tendency in most countries for the share of wages to rise or fall, either with respect to national income or with respect to profits. But year-to-year comparisons show some interesting variations, which, as the Survey points out, are worth examining because of the light they might shed on the behaviour of factor incomes in a period of fluctuating activity and prices. Of course, any fluctuations in prices and activity during the post-war era have been purely relative, for, taking the period as a whole, business activity has been consistently high and inflationary pressure has been the order of the day. But both the pace and the nature of inflation have often varied, and it will be of interest to note what effect these changes have had on the behaviour of wages and profits.

The interesting period from this point of view covers the years 1950–53. The early part of the period, extending perhaps to the first quarter of 1952, was characterised by a rapid inflation of prices and wages which followed the outbreak of the Korean War. This was followed by a partial recession in business activity and by conditions of greater price stability. How did the share of wages behave as a consequence of these changing economic conditions? Did the share fall, as one might expect, when inflation was most rampant? And did it recover as business recession began to put pressure (if it did) on profit margins?

At first sight no generalisation seems possible. Table I sets out the data on the share of wages for eight European countries over the post-war years. The authors of the U.N. Survey point out the absence of any typical behaviour. Whereas the share of wages rose in four countries (the United Kingdom, Denmark, France and the Netherlands) during the rapid inflation of 1951, it fell in four others (Belgium, Germany, Norway and Sweden). In

[1] U.N., *Economic Survey of Europe in 1956*, Chapter VIII.
[2] *Ibid.*, Chapter VIII, p. 8.

TABLE I

A. *The Share of Wages and Salaries in Income Arising in the Private Sector* *

	Percentages.							
	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.
Belgium	49·4	50·9	51·4	49·4	50·5	49·5	49·0	49·4
Denmark	43·8	42·8	41·4	41·7	42·0	41·9	43·3	43·3
France	—	50·1	48·7	51·4	52·0	52·7	53·7	53·3
Western Germany	—	—	56·3	54·3	55·9	58·3	58·1	59·2
Netherlands	50·4	49·0	48·8	50·8	50·0	49·0	50·2	52·6
Norway	51·4	52·4	52·1	48·0	51·0	54·0	52·8	52·6
Sweden †	60·6	59·8	59·3	57·2	61·3	63·0	62·7	—
United Kingdom	63·9	63·9	64·9	65·1	63·4	63·1	63·3	64·8

* The private sector is defined as all sectors of the economy other than public administration and defence. The data refer to *gross* income for Denmark, Sweden and the United Kingdom, and to *net* for all other countries. In principle, stock appreciation is excluded.

† Inclusive of public administration and defence.

Source: U.N., *Economic Survey of Europe in 1956*, Chapter VIII, Tables 1 and 5.

B. *The Terms of Trade* *

	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.
Belgium	100	105	91	100	103	90	90	93
Denmark	100	105	93	82	89	93	95	95
France	—	100	112	88	100	123	117	118
Western Germany	—	—	100	96	108	116	114	113
Netherlands	100	97	90	86	88	88	94	93
Norway	100	100	93	108	104	95	97	100
Sweden	100	89	92	127	108	99	100	100
United Kingdom	100	101	94	82	89	99	98	97

* Export prices divided by import prices.

the following two years the labour share recovered in Germany, Norway and Sweden; fell towards former levels in the United Kingdom and the Netherlands; continued to rise in Denmark and France; and pursued a fluctuating course in Belgium, rising in 1952 and falling again in 1953 and 1954. The Survey concludes that if any generalisation were to be ventured from this mixed group of countries "it could only be that the shares of wages and profits in national income do not greatly fluctuate in relation to each other except in circumstances that can be regarded as, in many ways, exceptional, such as the eighteen months following the outbreak of the Korean War; and even in that period profits did not invariably gain the relative advantage."[1]

It is somewhat surprising, however, that in their analysis the U.N. authors failed to take into account the very different experience of these countries in the behaviour of their terms of trade. Comparison of the bottom half of Table I with the top shows that for many of these countries a clear inverse relationship seems to exist between changes in their terms of

[1] *Op. cit.*, Chapter VIII, p. 14.

trade and the share of wages in their national incomes. Countries in which the share of wages rose during 1951—the United Kingdom, Denmark, France and the Netherlands—suffered a considerable worsening in their terms of trade, whilst in Belgium, Norway and Sweden a fall in the share of wages was accompanied by an improvement in the terms of trade. In the following two years movements of the terms of trade were generally reversed, and in four countries the inverse relationship persists. The share of wages in Denmark, France and Germany, however, continued to rise, despite an improvement in their terms of trade.[1]

It is not surprising, of course, that fluctuations in the foreign-trade sector affect the internal development of costs, prices and outputs in these selected countries. Whilst none of them (except perhaps the United Kingdom) is large enough to induce substantial changes in world prices of manufactured goods or primary products by events internal to themselves, all are heavily dependent on foreign trade, and therefore tend to be seriously affected by events happening overseas. It hardly seems wise therefore to ignore autonomous fluctuations in their import and export prices when investigating the causes of short-run fluctuations in their factor shares.

In a *closed* economy, *i.e.*, one in which we can ignore the foreign-trade sector, relative changes in prices, wages and labour productivity provide the key to short-run fluctuations in the share of wages. If productivity is constant, the share of wages relative to profits remains constant, rises or falls depending on whether prices rise at the same, or a slower or a faster rate than wages.[2] If productivity is rising the share of wages will clearly fall when wages and prices are rising at the same rate; and even if wages are rising at a faster rate than prices, unless they are rising at a sufficiently faster rate than both prices and productivity, the share of wages will still fall. Conversely, a fall in productivity will tend to raise the share of wages relative to profits unless prices are rising at a sufficiently faster rate than wages. An inflation characterised by a tendency for prices to rise faster than wages requires a continual rise in one or more components of non-consumption-type expenditure (*i.e.*, investment or government expenditure) in real terms; otherwise the fall in real-consumption expenditure associated with the fall in real wages tends to slow down the rise in prices and activity. Similarly, a persistent rise in wages relatively to prices, greater than the rise in productivity would warrant (*i.e.*, a persistent rise in labour costs relative to prices) must eventually bring itself to an end, since falling profits will at some point result in a cut in production and employment and slow down the rise in wages. It is therefore not surprising that taking the post-war inflationary period as a whole, we find little change in the relative shares of wages and profits.

Fluctuations in foreign-trade prices tend to affect the share of wages *in the*

[1] Reasons for this " exceptional " behaviour will be suggested later.

[2] We shall concern ourselves only with conditions in which prices and wages are rising, since these are typical of the post-war period.

short run by the impact they have on the balance of trade, on labour costs and on final product prices. A rise in export prices, induced, say, by a spontaneous rise in overseas demand, tends to increase profits in the export sector and to improve the balance of trade, particularly of countries whose chief exports are primary products or whose exports have similar inelastic supply conditions. To some extent rising export prices may cause a sympathetic rise in the cost of living, for example, if export products enter directly into consumption at home or are used as raw materials in home production. Wages are therefore likely to rise, but they are unlikely to be tied closely to export prices and profits, so that the share of wages will tend to fall. The experience of Norway and Sweden during 1950–51 is an obvious instance of this sort of development.

Whilst the effect of a boom in export prices is obvious, the effect of rising import prices is more complex. If the rise is substantial the internal price level is inevitably affected as producers and merchants at home attempt to pass on their increased costs; wages follow and an inflationary spiral is set in train. What happens to the share of wages does not depend solely, as it does in a closed economy, on the changing relationship between product prices and labour costs; in an open economy product prices and profits are affected not only by demand and labour costs but also, of course, by the rise in the cost of imported materials and components. An equi-proportional rise in wages and prices, for example, would not necessarily imply that wages and profits had also risen in the same proportion. If the cost of imported materials (and therefore average prime costs) had risen in greater proportion than labour costs, profit margins and the share of profits would have fallen.[1]

But will prices fail to rise in proportion to costs? If so, what factors are

[1] This can be shown as follows:

Let P = % change in final product prices, including export.
z = % change in import prices.
w = % change in wage-rates (and therefore in labour costs and wage income, if productivity and employment are assumed constant).
x = % change in gross profit income.
m = ratio of imports to total product.
l = ratio of labour costs (and income) to total product.
g = ratio of gross profit income to total product.

i.e.,
$$m + l + g = 1$$
$$\therefore \quad P = mz + lw + gx$$
and
$$x = \frac{P - mz - lw}{1 - m - l}$$

Dividing through by w, we have
$$\frac{x}{w} = \frac{\frac{P}{w} - m\frac{z}{w} -}{1 - m - l}$$

Thus if $P = w$, then:

(i) $x = w$ when $w = z$; (ii) $x > w$ when $w > z$; (iii) $x < w$ when $w < z$;

i.e., profits rise in the same, greater or less proportion than wages, depending on whether wages rise in the same, greater or less proportion than import prices.

likely to bring this situation about? Let us consider a simple model of the economy in which we assume: (*a*) that imports are solely or predominantly raw materials, the elasticity of demand for which is zero or at least very small; (*b*) that producers normally price their products by adding a constant-percentage gross profit margin to their prime costs (*i.e.*, labour plus imported material costs); (*c*) that labour productivity remains unchanged. Let us also distinguish between two sectors of the economy, one producing *consumption*-type goods, the other *non-consumption*-type goods, *i.e.*, investment, government and export goods; but let us make the further simplifying assumption that the import content (*i.e.*, the ratio of the value of imports to unit value of product) is the same for both sectors. Suppose that a given rise in import prices has occurred and that this has set in motion an inflationary spiral of prices and wages which, after a given interval of time, has run itself out. Suppose, further, that over the course of this interval wages have risen in less proportion than import prices—a reasonable supposition if the rise in import prices has been substantial. Then, on our assumptions of constant labour productivity and constant percentage profit margins, wages would have risen in less proportion than product prices; real wages would have fallen, and in all probability so would total real consumption.[1] Unless some other component of real expenditure—investment, government or export—had risen to offset the fall in real consumption, the volume of output would tend to be less than before the rise in import prices. There seems no reason to suppose that a rise in import prices would have induced a rise in either real government expenditure or real investment: indeed, if the money supply had been inelastic a fall in one or other or both is much more likely. On the other hand, it is not unreasonable to suppose that exports would have benefited from rising incomes overseas, so taking up resources released by the fall in consumption. If the increase in export demand has been sufficient to offset completely the fall in real consumption, then, owing to the fact that prices have risen in direct proportion to average prime costs, which have risen in greater proportion than wages, profits also would have risen in greater proportion than wages, and the share of the latter would have fallen. But failing a sufficient rise in exports, some decline in output must have taken place.[2]

[1] The effect on real consumption depends partly on the propensity to consume of wage-earners as well as on the change in their real wages; but given the conflicting pressures operating on the propensity to consume, *e.g.*, an upward pressure exerted by the fall in real income and a possible downward pressure exerted by the presence of money illusion, it seems safer and probably not far from the truth to assume that it remains constant.

If the import content of the non-consumption-good sector is greater than that of the consumption-good sector (which may be true of some countries, *e.g.*, Denmark and Norway) and if producers in the former sector have been successful in maintaining their percentage profit margins, then profits in this sector would have risen in greater proportion than consumption-good prices. This might have led to some increase in real consumption on the part of profit earners, thus offsetting to some extent the effect of a fall in real wages.

[2] If the assumption of constant labour productivity is relaxed, then there is no necessity for either real consumption or real output to have fallen. A rise in productivity, for example, would

In the event of such a downward pressure on output, however, it is unlikely that the assumptions of our model would continue to hold. In particular, it is unlikely that all producers would have insisted on, or have been able to insist on, maintaining constant percentage profit margins in the face of a decline in the volume of their sales; and clearly the greater the cut in their margins the less will have been the fall in their sales and the volume of output. In a limiting case where we can assume that no change had occurred in total output and the volume of imports, or in the real levels of investment, government or export expenditures, real consumption also would be unaffected. This would imply that wages must have risen in the same proportion as consumption-good prices, leaving real wages unchanged;[1] but since in our model we have assumed that wages have risen in less proportion than import prices, it follows that consumption-good prices must also have risen in less proportion than import prices and, therefore, in less proportion than average prime costs. Profit margins must therefore have been squeezed, and the share of profits relative to wages in the *consumption-goods* sector must have fallen. Even if profit margins on goods sold for investment, government or export use had been maintained—so that profit incomes in the non-consumption sector had risen relatively to wage incomes—owing to the greater weight of consumption output in total output, the share of profits in total income is also likely to have fallen.

Normally, however, a fall in sales is met, at least at first, by an enlargement of stocks rather than by a cutting of margins, but to the extent that stocks are valued at cost, *i.e.*, exclusive of the profit margin added on sale, a squeezing of profits as a percentage of the total value of output still takes place. Only a fall in output and employment will prevent the share of wages from rising. In practice, of course, a little of everything is likely to have happened: some cut in margins, some building up of stocks and some cut in output and employment; but to the extent that producers of consumption goods have resorted to one or other of the first two alternatives rather than the third, the greater is the likelihood that the share of wages will have risen.

Enough has been said to indicate that by virtue of its deflationary impact on demand, particularly for consumption goods, a substantial rise in import prices can have the effect of raising the share of wages in national income. But it must be stressed that a spontaneous or induced rise in export demand, whether this results in a rise in export volume or prices, can offset this effect.

permit money wages to rise in greater proportion than product prices, although still less than import prices; it would also permit a potential rise in total real output. It remains true, however, that if labour costs have risen in less proportion than import prices, money-wage incomes will have risen in less proportion than the potential money value of output (or to put it another way, the rise in real wages will not have kept pace with the rise in real output); and if the potential rise in real output is to be realised some rise in real investment, government or export expenditure must be forthcoming.

[1] This assumes a constant propensity to consume out of wage income. Cf. footnote 1, p. 741.

Indeed, if the rise in export prices is large enough to cause an improvement in the terms of trade (despite the rise in import prices), or if the rise in export volume is large enough to offset any deflationary effect on output the share of wages is more likely to fall than to rise. Further, any substantial changes in the shares of wages and profits relatively to each other are unlikely to be permanent. If the rise in foreign-trade prices has been the result of a temporary boom in commodities—as it was in 1950–51—the collapsing of the boom tends to reverse many of the effects we have analysed. On the other hand, if the rise in foreign-trade prices is once for all, wages and prices gradually adjust themselves to it, leaving the shares of wages and profits in their accustomed relationships to each other.

How far does the experience of the countries listed earlier bear out the substance of this theoretical reasoning? As Table I shows, all eight countries experienced large fluctuations in their terms of trade between 1949 and 1954. This was the result partly of currency devaluations in 1949, but mainly, as we have seen, of the outbreak of the Korean War in 1950. In general, predominantly industrial countries, whose imports are mainly raw materials and food, lost by the movements in their terms of trade between 1949 and 1951, whilst those exporting important raw materials gained. The gains and losses were reversed in the following two years, both because of the collapse of the commodity boom and because of the gradual rise in the price level of manufactured goods. We shall distinguish three phases: 1949–50, 1950–51 and 1951–53/4; and for each phase glance briefly at the movements of the terms of trade, the share of wages, the level of wages, labour productivity and the volume of exports in each of the countries with which we have been concerned.

Table II sets out the data for 1949–50. Five countries—the United Kingdom, Belgium, Denmark, the Netherlands and Norway—experienced a worsening in their terms of trade, and two—France and Sweden—an improvement. If we make the rough generalisation that the share of wages and the terms of trade are inversely related in their movements, then of the seven countries listed in Table II, four support the generalisation and three run counter to it. But it will be noted that in the case of the three counter-examples, Denmark, the Netherlands and Norway, an adverse shift in the terms of trade was accompanied by a very large increase in export volume, which, as we have argued earlier, would tend to offset and probably reverse any tendency for the share of wages to rise. In addition, labour productivity, particularly in Denmark and Norway, seems to have risen very markedly in relation to the rise in wages. Table III shows that the generalisation also holds very well in the period 1950–51, being borne out by the experience of seven of the eight countries. The exception, Germany, enjoyed a very large rise both in the volume of its exports and in their prices. Thus the share of wages fell instead of rising.

But between 1951 and 1953 the experience of our countries is more

diverse (Table IV). In the case of the United Kingdom, the Netherlands, Norway and Sweden, the generalisation continued to hold, but in four other countries the share of wages and the terms of trade were positively correlated. Possible explanations, however, do suggest themselves. In France, for example, wages seem to have risen very much faster than productivity, and although export prices also rose very considerably, prices at home were held down by deliberate government policy. Profits in the home market were therefore squeezed. Similarly, restrictive monetary policy in Germany and Denmark seems to have kept a tight pressure on profit margins whilst rising labour costs more than offset the fall in import prices. So far as Belgium is concerned, the change in the terms of trade between 1951 and 1952 was insignificant, and the share of wages was much more affected by an apparent decline in labour productivity and the continued rise in wages, which was not offset by a rise in the internal price level. But from 1952 to 1954, Belgium's terms of trade worsened, whilst the share of wages also fell; but this seems to be accounted for both by a considerable rise in export volume and by an almost complete stability of wages when productivity was rising fast.

There seems to be some empirical support, therefore, for the view that movements in the terms of trade and in the share of wages are related, although it must be remembered that the number of countries we have considered is limited and the period with which we have been concerned short. Also post-war fluctuations in the terms of trade have all been associated, very often as cause, with rising prices: favourable as well as unfavourable changes in the terms of trade have caused inflation in the countries experiencing them;

TABLE II

1949–1950

	Change in share of wages.	Percentage change in import prices (+ rise, − fall).	Percentage change in export prices (+ rise, − fall).	Percentage change in export volume (+ rise, − fall).	Percentage change in wages * (+ rise, − fall).	Percentage change in productivity† (+ rise, − fall).
Countries Whose Terms of Trade Worsened						
Belgium	Increase	+ 4	−10	+15	+ 6	+ 4
United Kingdom	Increase	+14	+ 6	+15	+ 4	+ 5
Denmark	Decrease	+10	− 2	+33	+ 5	+ 6
Netherlands	Decrease	+12	+ 4	+35	+ 7	+ 7
Norway	Decrease	+ 9	+ 2	+33	+ 4	+10
Countries Whose Terms of Trade Improved						
France	Decrease	+11	+23	+30	+ 8	0
Sweden	Decrease	+19	+23	+25	+ 4	+ 4

* Earnings.
† Manufacturing production divided by Employment in Manufacturing.

TABLE III

1950–51

	Change in share of wages.	Percentage change in import prices (+ rise, − fall).	Percentage change in export prices (+ rise, − fall).	Percentage change in export volume (+ rise, − fall).	Percentage change in wages (+ rise, − fall).	Percentage change in productivity (+ rise, − fall).
Countries Whose Terms of Trade Worsened						
Denmark	Increase	+27	+11	+12	+10	+ 2
France	Increase	+30	+ 2	+15	+28	+10
Netherlands	Increase	+23	+17	+18	+ 7	+ 2
United Kingdom	Increase	+33	+16	0	+11	+ 2
Western Germany	Decrease	+27	+22	+43	+14	+10
Countries Whose Terms of Trade Improved						
Belgium	Decrease	+20	+33	+21	+16	+ 7
Norway	Decrease	+20	+38	+11	+14	+ 4
Sweden	Decrease	+30	+79	+ 4	+24	+ 3

TABLE IV

1951–53

	Change in share of wages.	Percentage change in import prices (+ rise, − fall).	Percentage change in export prices (+ rise, − fall).	Percentage change in export volume (+ rise, − fall).	Percentage change in wages (+ rise, − fall).	Percentage change in productivity (+ rise − fall).
Countries Whose Terms of Trade Improved						
Netherlands	Decrease	−13	−10	+23	+ 4	+13
United Kingdom	Decrease	−14	+ 2	− 3	+15	+ 2
Belgium (1951–52)	Increase	− 3	0	− 6	+ 5	− 3
Denmark (1951–54)	Increase	−13	0	+13	+18	+ 9
France	Increase	−11	+26	− 5	+22	+ 4
Germany	Increase	−16	+ 1	+25	+14	+ 8
Countries Whose Terms of Trade Worsened						
Norway	Increase	− 2	−14	− 5	+20	+ 7
Sweden	Increase	−12	−33	− 4	+25	+ 2
Belgium (1952–54)	Decrease	−10	−21	+20	0	+ 7

and we need not expect the relationship to hold in a period of falling prices. What has differed, however, has been the nature of inflation itself. Thus, where inflation has followed a favourable swing in the terms of trade, as in primary countries benefiting from a boom in commodity prices, it has taken the classical form of a demand inflation. The autonomous improvement

in the balance of trade has been equivalent to a rise in investment over saving, prices have risen, wages have followed and an inflationary spiral set in train. In general, for some considerable time wages and labour costs have lagged behind the rise in aggregate monetary demand and the share of wages has fallen. In the industrial countries, however, inflation has usually followed worsening terms of trade brought about by a rise in import prices; but this is essentially cost inflation. The balance of trade worsens not, be it noted, because of a sudden increase in excessive demand at home, but purely because of the rise in import prices; and although monetary demand rises as wages follow prices upwards, very often it does so at a slower rate and in less proportion than monetary costs. In consequence, profit margins are squeezed, stocks enlarged, output restricted and the share of wages rises. Indeed, a better generalisation than the one with which we have been dealing in the body of this paper might well be that changes in the share of wages in a period of rising prices depend on the character of the inflationary process itself, the share falling when demand is playing the key role and rising when costs take the lead; and it may well be that where other indications are not clear as to the nature of a particular inflationary situation a change in the share of wages will provide the necessary clue.[1]

G. MAYNARD

The Johns Hopkins University,
Baltimore.

[1] The questions whether a *cost* inflation exists and, if so, in what way it differs from a demand inflation, have been bothering economists in recent years. It is not sufficient to point to cost-raising forces, since it is often the case that these same forces increase demand as well. It is obvious, for example, that rising wages increase monetary demand as well as costs. Admittedly, rising wage costs tend to have a more immediate effect on prices than a purely demand-raising force, like an increase in investment or government expenditure, since business-men pay more immediate attention to their costs than to their sales when altering their prices. Nevertheless, it remains true that if rising wages are inflationary they are so because they raise both demand and costs.

What would happen if the extra wage income was taxed away as wages rose? Or, alternatively, if the Government reduced other forms of demand—investment or its own expenditure? Prices would probably still rise at first, but at the expense of some fall in sales and output. This suggests that a good way of distinguishing between demand and cost inflation is by reference to changing monetary demand and costs *relative* to each other. If the former is increasing at a faster rate than the latter, then we have demand inflation; if the reverse is true we have cost inflation, which is accompanied by a fall in sales and output. If monetary demand and costs are increasing at the same rate, then we have inflation, which is neither particularly demand nor cost, but which, however, is more genuinely inflation, since it is likely to persist over a longer period.

THE OPTIMUM RATE OF INVESTMENT[1]

Introduction

1. The problem discussed in this paper is generally known as the problem of the "optimum rate of saving." The change in the terminology suggested in the title is not only a formal matter. It is intended to indicate the difference in the approach.

The discussion of the optimum rate of saving has hitherto been based on various considerations concerning utility maximisation. Essentially they involved comparisons between "present sacrifices" and "future gains." The first solution offered was that by F. Ramsey[2] as early as 1928. Ramsey's method consisted in comparisons between potential satisfactions in the state of "Bliss" (the maximum obtainable rate of utility) and the satisfactions of the current income. The most recent solution comes from Professor Tinbergen,[3] who derives it from particular assumptions about the shape of utility functions (logarithmic and hyperbolic) and the value of the "psychological discount" (the rate of time preference).

Both Ramsey's and Tinbergen's approach, as well as other attempts along similar lines, yield determinate solutions. But they are obviously not designed for being put to practical use: the concepts used exclude statistical measurement. Therefore in practical work another approach is often used. In planning economic development usually some constraints are postulated, *e.g.*, consumption must not fall below certain level; they are arbitrarily defined and then, considering these constraints as data, the saving decision is reached.

Thus so far we have been left with a choice of two alternative solutions: one determinate but impossible and the other practically possible but theoretically indeterminate. It is the scope of this paper to examine a possibility of a third solution, which would be both practicable and determinate.

2. For the start let us define a few basic concepts which will be used throughout the analysis.

(1) Gross social product and, consequently, the additions to gross social product will be conceived and computed net of services not intimately connected with material production (public administration, defence expenditures, etc.; transport and trade services are included). This definition of *GSP* is adopted partly with regard to available empirical data and partly because it simplifies the analysis.

[1] The basic ideas elaborated in this paper were first expounded in a talk given to the Staff Seminar in Economics at Manchester University in May 1957. I benefited from the discussion at the Seminar and afterwards. Professor Devons and Dr. Martin have been kind enough to read the manuscript and discuss it with me. But, of course, I am alone responsible for it.

[2] F. P. Ramsey, "A Mathematical Theory of Saving," Economic Journal, 1928.

[3] J. Tinbergen, "The Optimum Rate of Saving," Economic Journal, 1956.

(2) The phrase "productive investment" will mean investment producing an increment in *GSP* as defined in the preceding paragraph.

(3) In addition to the general distinction between investment and consumption, two further distinctions will be made. Thus social product will be considered to consist of four different parts. They are:

(*a*) Investment in the material factor of growth which causes the expansion of productive fixed and circulating assets. This part of *GSP* will be referred to as "investment."

(*b*) Investment in the human factor of growth (termed as *A*-factor) which increases the ability of the society to produce material goods. To distinguish (*b*) from (*a*) it may be called "productive expenditures."

(*c*) and (*d*) The remainder of social product is divided between personal and communal consumption. As a matter of fact, parts of (*c*) and (*d*) are physically identical with (*b*). The reason for putting certain consumption goods and services into (*b*) is that their consumption leads to an increase of *GSP*. If these consumption goods and services lose their positive productive effect, they will be classified only as (*c*) and (*d*). The (*c*) and (*d*) parts of *GSP* will be referred to as "consumption."

(4) It will be assumed that maximisation of consumption, as just defined, is the sole aim of the society's productive efforts. This will imply that if there is a choice between smaller and greater consumption, other things being equal, the society will choose the alternative with greater consumption. If other things are not equal, the society will face a choice—*e.g.*, maximum consumption as against maximum military strength—which falls outside this paper and, indeed, outside the scope of economics. However, society will normally not have to choose between greater consumption and greater production. One of the main purposes of this paper is to prove the identity of these two aims in the real world.

The Concept of the Absorptive Capacity of the Economy

3. Instead of maximisation of utility, it is proposed to consider the maximisation of production through time. Production is maximised with respect to a specified period, the length of which is determined by some physical properties of the economic process.

Maximisation involves not only the allocation of factors of production now, but also the adjustment of their various rates of expansion in the future. The potential effect of the optimum adjustment of the growth rates of factors is defined as the absorptive capacity of the economy. The easiest way to use this concept is to conceive the economy as a giant productive capacity capable of being expanded at a certain *maximum* rate, also at a lower rate, but *not at a higher rate*. Any additional inputs (investment) would not produce *additions* to but *reductions* of output. Or, applying (with caution) the conventional terminology, marginal efficiency of investment will be zero or negative.

Zero marginal efficiency of investment does not necessarily mean zero

marginal efficiency of capital.[1] The latter is a static while the former is a dynamic concept. It means even less that the rate of interest is zero. In fact, the belief that the positive rate of interest is an evident proof that the marginal efficiency of investment is still positive—seems to have prevented a further exploration of the practicability of production maximisation. It has been observed that in normal circumstances the rate of interest has never vanished; it existed with investment expenditures however large. It was therefore believed that only an extraordinarily high rate of investment would drive the marginal efficiency of investment towards zero. And an extraordinarily high level of investment would imply an extraordinarily low level of consumption. One has therefore to weigh "present sacrifices" with "future gains," and this is the domain of the utility calculus.

However, the actual economic process is somewhat different. To show this in the simplest possible way let us consider its characteristics in a planned economy.

Investment–Production Function

4. Investment is made to increase production. There is therefore some relation between the addition to the output stream and the productive investment which has caused it. There is also a time lag between the cause and the effect known as the maturation period of investment (m). The ratio between additional output [2] in this year and the investment [2] made m years earlier we shall term "production coefficient" $\left(p = \frac{\Delta GP_t}{I_{t-m}}\right)$. The change of p as a function of investment will be called "investment–production function" (*IP*). This function may be diagrammatically represented in the following way:

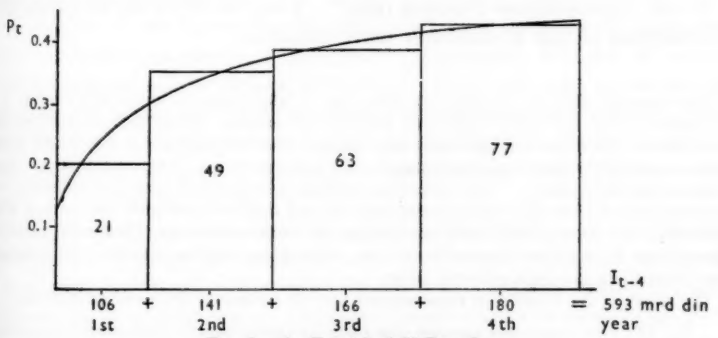


FIG. 1.—An Empirical *IP* Function

[1] This has been pointed out by A. Lerner, who coined his famous symbol *mei* (*Economics of Control* (New York, 1944), pp. 260 ff.).

[2] Output is defined as gross product and investment as the addition to the stock of productive capital, *i.e.*, statistically as gross investment net of replacement. However, in the following empirical illustrations gross investment figures will be used because of the lack of reliable data for net investment.

It is fortunate that here we are able to make use of an empirical diagram.[1] The need for representing three variables in a two-dimensional co-ordinate system has made for a little unusual construction of the diagram; it is, however, perfectly simple once the meaning of it is grasped. The ordinate shows the values of the production coefficient, which in four (adjusted) years has risen from 0·2 in the first year to 0·43 in the last one. The abscissa shows successive doses of investment expressed in milliards of dinars. The additions to social product are related to investments made four years earlier (maturation period). In each successive year the "dose" of investment has been increased, bringing the total for the whole period equal to 593 milliard dinars. If we multiply "investment doses," represented by the segments of the abscissa, by the respective production coefficients, we get increments in output which, in the diagram, are represented by the areas of the respective columns. The figures inside the columns indicate the size of these increments. The total increase in output in the period under consideration is equal to the sum of the areas of the four columns, $\Delta GP = \sum_{1}^{4} \Delta GP_t = 210$ milliard dinars. It is this last figure which will become our main object of analysis as we proceed. Finally, the free-hand drawn curve is intended to approximate continuous changes in the production coefficient. The area under the curve is, of course, equal to the sum of the increments in output, $\int_{0}^{593} p(I)dI = \sum_{1}^{4} \Delta GP_t$.

The main lesson this diagram teaches us consists in the demonstration of the possibility of great changes of production coefficients. In four years the value of p has increased by more than 100%. This is obviously not due to the technological changes only.[2] Thus we have to investigate the characteristics of our *IP*-function more carefully.

[1] The diagram refers to Yugoslav economy and is taken from an unpublished study by the author prepared for the Federal Planning Bureau. Investment (gross) and production (gross) figures (prices: 1952) are four-year averages (period 1947–57), because it was found that the maturation period for the Yugoslav economy is about four years. The data refer to industry (manufacturing and mining). The production coefficient for the whole economy increased in the same period from 0·18 to 0·37 (gross investment does not include investment into houses, schools, hospitals, etc., and gross product does not contain the value of services). Industrial rather than whole economy *IP*-function is shown because the period is too short to eliminate the influences of the agricultural weather cycle from the latter.

[2] The causes of this spectacular improvement may be tentatively described as follows:

(1) The most important impulse was given by the far-reaching economic reorganisation started in 1951–52. The managerial system with the rigid administrative central planning and control (more or less a copy of the Soviet economic organisation) has been gradually replaced by a combination of workers' management plus global planning through market instruments plus some central decisions concerning major investment projects.

(2) The tempo of investing has been slowed down and the know-how has been gradually improving.

(3) Changes in the structure of investment occurred: after the basic industrialisation

5. The assumption from which we started was that the absorptive capacity of the economy was limited: additional investment beyond certain limits brought about negative increments in output. Thus we may say that *IP*-function depends on the quantity of investment (I) and on the absorptive capacity of the economy (A) and on the speed of their expansion $\left(\frac{dI}{dt}, \frac{dA}{dt}\right)$, or in symbols

$$p = f\left(I, \frac{dI}{dt};\ A, \frac{dA}{dt}\right)$$

Investment has to be absorbed by the economy. How well this will be done depends on the human factor A. The complex factor A may, perhaps, be made a function of four basic factors (policy variables) and of their changes: of personal consumption, health, knowledge, and of economic and political organisation. In addition, all other relevant characteristics of the economy may be conveniently lumped together as a single exogenous factor E.[1] Thus we get:

$$\left(A, \frac{dA}{dt}\right) = g\left(C, \frac{dC}{dt};\ H, \frac{dH}{dt};\ Kn, \frac{dKn}{dt};\ O, \frac{dO}{dt};\ E, \frac{dE}{dt}\right)$$

The factors (apart from E) are arranged according to the degree of their tangibility and physiological importance for human beings; their importance for the economic process (measured by changes which various factors may provoke) is roughly of the reverse order. The meaning of A-factors may be described very briefly in the following way.

Personal consumption has a great incentive value in a poor society. It may, therefore, influence the productivity appreciably. It may be added that in a growing economy the alternative to be chosen normally lies in the direction of an increase; the possibility of a decrease of consumption cannot normally arise in a rationally constructed scheme of economic development as will be shown presently. (The only two probable exceptions seem to appear in societies with an extreme inequality in the distribution of income or where mass enthusiasm had been created; in both cases total consumption may temporarily stagnate or even decline without causing a contraction of A.)

That the improvement in the ***health*** standard leads to an increase in the productivity of labour is notorious. A suitable generalisation will perhaps be provided by quoting the estimate of J. J. Spengler that the potential productivity of population of underdeveloped countries would rise 20–30%

programme had been accomplished by the first Five Year Plan (1947–52) relatively more was invested in extensions and relatively less into new factories. A survey made recently in Croatia showed that the capital productivity of extensions was about 50% higher.

[1] The exogenous factor E has been inserted to make the algebraic presentation formally correct. As, by definition, E is not a policy variable, we shall not be concerned with it, and we shall always assume that E is somehow given and known. In actual planning, of course, the analysis of E is of an extreme importance.

if the age composition and state of health of their people could be "Westernised." [1]

Factor *knowledge* comprises all degrees of skill, including scientific research. The experience of planning seems to suggest that knowledge (and certainly not investment resources [2]) is the most important scarce factor in underdeveloped countries with otherwise favourable social climate. Thus growth of "know-how" is likely to pose the limits to the general economic development.

The last policy factor, termed *economic and political organisation*, refers to the institutional set-up of the economy. Inadequate economic organisation and political discontent and instability are likely to upset the productive effect of all other factors and so to minimise the value of A. But factor O may also considerably increase the value of A, as may have happened, for instance, in India as a result of having achieved political independence or in China after social revolution. Factor O is usually taken as a datum in the economic analysis, and nothing prevents us from following this traditional line here too. Yet there is also some justification in assuming that in a rationally organised society the shaping of such an important productive factor will not be left to the haphazard play of blind social forces, but will be undertaken with at least some degree of rationality as it is the case with factors C, H and Kn. Planned economy may be assumed to experiment not only with micro- but with macro-organisation as well. And the effects are not as intangible and immeasurable as they may seem at first glance. It suffices to compare the economic results of various solutions applied in similar situations. For instance, the agricultural policy of Poland with that of Eastern Germany, or the economic results of the managerial system in Bulgaria and in Soviet Union with those of workers' management system in Yugoslavia, or underdeveloped countries with planned and unplanned economies. In any case, given or changeable, O is an important limitational factor.

6. The foregoing considerations show that A is in principle measurable and that in practice its value can be well approximated. The next step in the analysis consists in an examination of the relation between A and I. An image of a vessel (A) into which liquid (I) is poured from outside springs to mind. However, the picture is a little more complex than that. The

[1] J. J. Spengler, "The Population Obstacle to Economic Betterment," *American Economic Review, Proceedings*, May 1951, p. 344. Spengler also compares the estimate of D. Ghosh for India, where about 22½% of the national income is spent on maintaining those who die before they reach the age of 15, with that for England, where the corresponding figure is only 6½% (*ibid.*, p. 351).

[2] This is also obvious from the structure of IP-function. Investment is something relative, it is the share of investment in social product which is analytically meaningful. Given enough time, the share of investment may be increased as far as we like (short of 100%). The question is only whether the economy will absorb it. We are accustomed to think of investment as an independent factor of growth. However, in a rationally organised economy it would be more appropriate to treat it as a product of growth. Given A, the economy is able to produce any amount of I which can be productively applied.

vessel itself produces the liquid, which in turn causes the expansion of the vessel. This feedback operates with diminishing force, and the movement comes to an end when the vessel is filled up and additionally generated liquid is uselessly spilt. This is the point of optimum.

In other words, A and I are obviously interrelated. Investment makes possible the expansion of the community's absorptive capacity; A imposes the limits to the productive application of I. The absorptive capacity may now be redefined to mean the ability of individuals and of the society as a whole to manipulate the stream of output increments. This ability is limited because there is a given level and a limited speed of potential expansion of the will to work, of the state of health, of the number of skilled workers and scientists and of the institutional readjustments. Being limited, A may be taken as a datum (although a changing one) and I may be defined as its function, $I = f(A)$. So defined, investment is the *maximum investment which may be productively applied* in a given economy. Thus the *optimum* path of the investment–production function will be given by

$$p_{\text{opt}} = F[I(A)]$$

In this way the optimum rate of investment is determined.

Maximisation of Output Increment

7. For the purpose of application it will be necessary to reformulate slightly the last result using the inverse functional relationship of I and A. The problem will now be formulated as follows: try various quantities, collections and sequences of I, and for each of them adjust A in the optimum way. Then A becomes a function of I, $A = \phi(I)$, and various possible IP functions will be expressed by $p = \Phi[A(I)]$. Our task is now to integrate all these functions and to find the maximum integral

$$\text{Max. } \Delta GP = \text{Max.} \int_0^{I_m} \Phi(I)\, dI$$

Maximum integral represents the maximum possible increase of production in a specified period of the length m. As any other combination of investment would result in a smaller addition to output, this integral provides the formula for the optimum rate of investment.

There is also a third alternative method of finding the optimum rate of investment. Define capital coefficient as $k = \frac{1}{p}$. Increment of output in a specified period is derived from

$$I = k\Delta GP$$

where k is an average capital coefficient computed with respect of the period as a whole. Capital coefficient is functionally related to investment. After a certain point, further increase in investment will increase the value of k. Until the relative increase of k is less than the relative increase of I, the

change is worth while, because ΔGP will be expanding. The optimisation rule follows directly:

$$\eta_{kI} = 1$$

expand investment until the elasticity of the average capital coefficient with respect to investment becomes equal to one.

8. The choice we shall have to make may be clarified by recalling our *IP* diagram.

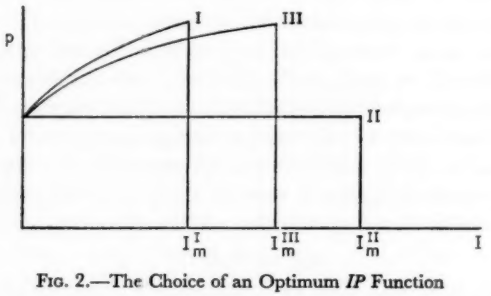


FIG. 2.—The Choice of an Optimum *IP* Function

Again, as in Fig. 1, the areas under the curves represent total additions to social product in a period of so many years. All alternatives are considered with respect to the same period of time. In this period various amounts of total investment may be undertaken and, given the total amount, various combinations of successive yearly investment doses are possible. In fact, the number of conceivable variations in both categories is unlimited. We shall not bother about the latter, and from the former we choose three representative cases. Before we proceed let us clearly realise that we are not analysing the curves themselves but the areas under the curves. Still, in drawing the curves one rule has to be observed: given the length m of the period under consideration and given the total amounts of alternative investments in this period, I^{I}_{m}, I^{II}_{m} and I^{III}_{m}, distribute investment over time in such a way as to maximise total potential output increment in every case. In other words, to be comparable with each other, curves should be optimum curves with respect to the chosen total amounts of investment. Now, suppose that our curves satisfy this condition. Then their shapes become irrelevant, and in searching for an optimum optimorum the relative areas have to be compared. The three representative areas in the diagram are chosen so as to represent the following relation between respective additions to social product: $\Delta GP^{I} < \Delta GP^{II} < \Delta GP^{III}$.

The first of the three *IP* curves may be conveniently termed the "underplanned solution" (historically the capitalist case); the second one the "overplanned solution" (historically, perhaps, the Soviet case); the third one represents optimum. The first solution shows the lowest rate of growth. The capital productivity (p) is higher than in either of the remaining two

solutions, but the total increment of output is the lowest due to the under-investment. The second solution achieves much higher rates of growth than the first one, but due to overinvestment, negative outputs have been produced.[1] This becomes clear when the alternative II is compared with the alternative III where smaller total amount of investment creates larger addition to the social product than in II. The area under the curve III is the largest, and therefore this alternative should be chosen in formulating investment decision (granting that the sole aim of economic planning is production maximisation).

9. In paragraph 7 the term "specified period m" was used. The best practical approach to determine this period seems to be to identify it with the longest maturation period of the important productive factors. We may then tentatively proceed in the following way. The average maturation period of investment is about three to four years. It will take some four to ten years to achieve any appreciable change in the number of skilled and highly skilled workers. And the training of the university graduates and the development of the research institutions will require more than

[1] There are some reasons to believe that this was what actually happened in the pre-war years of Soviet industrialisation. Apart from the existing verbal descriptions of the economic conditions of that time, the following statistical comparisons may perhaps shed some light. According to the last Soviet statistical publication (*Narodnoe Khozjajstvo S.S.S.R., Moscow*, 1956, pp. 28 and 158–9) in the period 1928–40 the total productive capital and national income were expanding at approximately the same rate (indices: 1928 = 100, 1940 for capital 445 and for income 514). If these figures have any value as indicators, then they indicate that in the whole period of twelve years the production coefficient remained substantially unchanged (as it is assumed in the diagram above, curve II). It would seem plausible to assume that at the beginning of planning in the U.S.S.R. the production coefficient and the share of investment were not substantially higher than those at the beginning of the planning in Yugoslavia. Further, according to the same source, the cumulative annual rate of expansion of total (?) investment (*kapitalnye vloženija*) in the period 1929–40 (no figures for 1928) was 17%. The rate of growth of gross investment (housing, etc., excluded) in Yugoslavia in four adjusted years was 10% and production coefficient increased in the next four-year period from 0·2 to 0·4 (it will be recalled that p computed on the basis of new investment would be more correct). If on the basis of these data Soviet and Yugoslav *IP* curves are constructed, their shapes turn out to be very similar to those of curve II and curve III in the diagram. The whole comparison is obviously very hypothetical. But it seems to suggest a possibility of an, at least occasional, overinvestment practice in the U.S.S.R. in the first phase of industrialisation, and it also shows the possibility of achieving quite conclusive results on this matter if statistical series were more reliable and more comparable with each other.

It may also be noted that only in a situation of overinvestment, when the increments of output become negative, the popular belief that high level of investment is incompatible with the high level of consumption is a correct description of facts. Overinvestment cuts consumption at both ends: the total product is smaller than it otherwise would be, and in this smaller product the share of investment is greater than necessary. Does not this explain another well-known feature of the Soviet economic development, namely the relatively slow expansion of personal consumption, what hasty critics of the system identified with *every* planning for rapid growth? Particularly if one bears in mind that the already diminished total volume of consumption was further diminished by relatively heavy defence expenditures and large communal consumption in general, so that not much was left to personal consumption. Consider Yugoslav example again. Instead of doubling production coefficient, it would (hypothetically) have been kept constant and the amount of investment could have been doubled (increasing its share to more than 40% of *GSP*). In this hypothetical case all additional investment would have meant equal loss of consumption without any gain in the higher rate of growth.

ten years. Perhaps twelve years or three four-year plans will constitute the planners' horizon.[1] Then within this period the expansion of A and I will have to be adjusted in an optimum way.

The maximisation over the whole period may mean that there will be no maximum at any of the three sub-periods. Productive factors are always to a certain degree flexible. The students may be sent to factories instead of to universities and the output of this year will be increased. Or we may plan the development of an industry with the short maturation period but with a bad production coefficient; the output in the sub-period will again be increased. Therefore optimum and maximum in the sub-periods have to be carefully distinguished.

This also calls for a careful handling of the concept of marginal efficiency of investment (*mei*). To achieve maximum output *mei* has to be made zero. But in any sub-period and for any *individual* business *mei* may be greater than zero. This explains the secret of the positive rate of interest in a situation of a zero or negative *mei*. Interest rate is the price for the scarce factor of production called capital, when capital is being distributed among alternative uses. But interest rate has nothing to do with the marginal productivity of the *social* capital (entire capital treated as a whole). If investment is pushed beyond the frontier of A, the additional factory, being a modern one, may very well earn substantial profit. But at the same time the process described by the curve II in Fig. 2 will take place: external diseconomies *with respect to the economy as a whole* will outweigh the positive contribution of the *additional factory*. Additional investment simply reduces the general efficiency of the economy and, for that matter, of the capital employed. This is a reduction in total, not only in marginal product, by an absolute amount, not only of the last unit of investment relatively to the last but one. The distinction is similar—but not more than similar—to that between marginal product and marginal revenue in the theory of the firm: marginal value product may be greater than marginal cost, and still the firm will experience a decrease in profits because marginal revenue is less than marginal cost. Long before an additional factory is earning zero returns additional investment will cease to be productive. Thus one may conceivably speak of two *mei*: one with respect to the last unit only, and another one with respect to the economy as a whole. The latter determines the optimum rate of investment. In this respect the empirical p curves should also be handled with caution. Reconsider our diagrams.

[1] In fact, planners' horizon may be determined quite exactly (theoretically). The principle is essentially the same as in engineering design. Economic mechanism is not an absolutely precise machine; on the contrary, the adjustment tolerance of its cogs is quite considerable. On the other hand, additional gains in the precision of planning are rapidly decreasing with the extension of the horizon. The point where these "precision gains" become equal to the existing "tolerance margins" of the economy represents the limit of the desirable length of the planning period. It should be borne in mind that a long-period plan is not at all absolutely binding. Every year the horizon is extended for another year and the plan will be adjusted to new circumstances.

In every successive investment period the amount invested may increase, increasing at the same time the value of p (see Fig. 1). As p is rising throughout the period one is tempted to say that marginal efficiency of investment is rising (the shares of other factors being neglected for the moment). But taking the period as a whole, the optimum *IP* curve may lie below or above the actual curve (see Fig. 2). In the first case (curve I) *mei* is actually positive, and all potentialities of the system have not been exhausted. In the second case (curve II), although marginal $p = 0$, the true value of *mei* is negative: overinvestment has occurred. An analytically meaningful definition of *mei* will then read as follows: marginal efficiency of investment is the (positive or negative) change of (actual or potential) total increment of output caused by an additional unit of investment anywhere in the maximisation period. In other words, *mei* has meaning only with respect to the whole maximisation period.

It should also be noted that the concept of *mei* is used here in its gross formulation; rewards for factors other than capital have not been deducted. Thus $mei = \frac{d\Delta GP}{dI}$, it is a change of physical output per unit of additional investment. This is the consequence of our basic assumption of the absorptive capacity of an economy as being measurable by the volume of the total increment of physical output the economy is capable of achieving in a specified period. As a moment of reflection will show, in this conceptual framework there is no need for a net concept.

The Nature of Period Maximisation

10. There is a difficulty, not so far mentioned, in the procedure of period maximisation. Because of the interdependence of factors and the time lags the maximisation has to be carried out with respect to infinity. There is logically no possibility of confining it to a single period. We may, for instance, plan the output of university graduates to-day for the beginning of the twelfth year. But what about all the intervening years? If, say, in the eleventh year we again reduce the expenditures on the university training (and send students to factories [1]), the output of the first twelve years may be overmaximised, but it will certainly not be maximised in the period of next twelve years and in the whole of the two periods combined.

It must be possible to design a rule which will prevent overmaximisation of the kind just described. Proceed in the following way. Construct first *IP* curve on the strict maximisation principle. Estimate the difference of the potential future productivity of factors when expanded as compared with the state in the first *IP* curve. Then readjust *A* factors and redraw the

[1] This, naturally, does not imply regimentation, but refers to those marginal changes which may be achieved by material stimulation or destimulation or, in this case, by changing the standards of admission. Besides, these changes—being marginal—are probably practically not very important, and the whole problem is much more a problem of theoretical principles than of practical application.

IP curve. If the resulting loss of output in this maximisation period is less than the next period's increment due to the present readjustment, the change is worth while making. Now, it is obvious that the productivity in the next period cannot be estimated with precision. To achieve a precise estimation one would have to draw the *IP* curve for the next period as well, and to do this one more *IP* curve for another period ahead and so forth *ad infinitum*. As we cannot predict infinity, we have apparently encountered an insurmountable difficulty.

Yet, is this difficulty really different from that inherent in any prediction? Can we say we *know* what is going to happen to-morrow, or even next hour?—As soon as we leave the static world, we are in the world of approximations, all differences in precision are only differences in degree. We choose the length of our maximisation period not because we pretend to *know* the pertaining *IP* curve, but because this procedure is operationally simpler and yields better *approximations* than if we deal with a much shorter or with a much longer period. In the same way we do not *know* the *IP* curve of the next period, but we have some elements to estimate the *approximate* productivity of factors which are of interest for us. The further we go into the future the less certain our approximations are—but also the less relevant for our present position.

The difficulty encountered is, therefore, not peculiar to this particular approach. It is the " aporia " of the real world, and may be escaped only in a static world with no changes. And if we prefer not to follow the recipe of ancient Eleatic philosophers and eliminate movement as logically wrong—we are left to accept things as they are and to conceive planning as an infinite process of gradual approximation. The task of the economist is to design methods which will increase the degree of approximation in a dynamic world—not to remove change from it.

The Evaluation of Present Sacrifices

11. So far, well and good. The examination has in fact been predominantly theoretical. But—as it is often said, and may well be said once again—it is hardly a practicable proposition to push investment so far as to make $mei = 0$. This would imply an exceptionally great increase of investment, which then involves considerations of present sacrifices of consumption. If it were for only 1 or 2% of social product to be added annually to already existing investment funds, the whole thing might have practical value. Otherwise, who can make consumers agree to refrain from consumption for the sake of future generations?

Here we may pause for a moment. It is exactly those 1 or 2% which are needed. To demonstrate this a simple model will be constructed. The model will be as crude as it is simple, but it will give us an idea of the order of values, and this is all we need.

Suppose there is a regularly growing economy with the share of investment in social product $s = 15\%$, capital coefficient $k = 3$ and, therefore, with the rate of growth $r = 5\%$. Suppose next that each year respectively 1 and 2% are added to investment fund causing the following year an additional increase in output and increasing thus continuously the rate of growth of output; k is supposed to remain unaffected by these changes. On these assumptions output and consumption will be changing in the following way:

Year.	Pattern I.			Pattern II.			Pattern III.		
	Output.	s, %	Consumption.	Output.	s, %.	Consumption.	Output.	s, %.	Consumption.
0	100	15	85	100	15	85	100	15	85
1	105	15	89	105	16	88	105	17	87
2	110	15	94	111	17	92	111	19	90
3	116	15	98	117	18	96	118	21	93
4	122	15	103	124	19	100	126	23	97
5	128	15	108	132	20	105	136	25	102
6	134	15	114	140	21	111	147	27	108
7	141	15	120	150	22	117	161	29	114
8	148	15	126	161	23	124	176	31	121
9	155	15	132	173	24	132	194	33	130
10	162	15	138	187	25	140	216	35	140

In the first year the change in investment policy *relatively* reduces consumption; since then the rate of growth of consumption is constantly increasing. It will take respectively nine and ten years to surpass the level of consumption of the original pattern of growth. The result is not substantially altered if the share of investment or the capital coefficient is changed (see Appendix I).

The differences in the consumption during the whole period are relatively small; the greatest, in the middle of the period, is of the rank of 6% which indicates the lag of only one year. The crop fluctuations in underdeveloped countries, the industrial fluctuations in developed countries and, in both of them, the unproductive expenditures of government such as defence, not to speak of war expenditures, are all far in excess of this difference. Bearing this in mind, it is realistic to expect that if a nation is asked to accept a programme which envisages that a certain level of consumption will be achieved in the fifth instead of the fourth year, with all the good consequences [1] afterwards—it will wholeheartedly accept this programme,

[1] One of the good consequences may appear as a considerable " free gift of nature " caused by relativity properties of the economic system in motion. Namely, capital costs, *ceteris paribus*, are not fixed, but are conditioned by the speed of growth. The greater the speed of growth the smaller capital costs per unit of output will be. Or, alternatively, the same piece of equipment will, *ceteris paribus*, produce about 3½ times larger total output in an economy growing at the rate of 10% than in the one growing at the rate of only 3% (if productive life of equipment is 30 years and the productive capacity of it remains approximately constant); for the rigorous demonstration see my " Depreciation Multiplier " in the forthcoming issue of the *Manchester School*.

and by accepting the programme it will push its economy on the path of the maximum rate of growth, for this programme implies an annual increase of the investment at the rate between 12% (pattern II) and 18% (pattern III). And exactly in this range the maximum rate of expansion of *A* is likely to lie, as it has been demonstrated by Soviet and Yugoslav economies which occasionally even overshot the mark of productive investment.[1]

The general result of the analysis so far consists, then, in the conclusion that the production maximisation is not only a theoretically determined but also a practicable proposition. The final question which remains to be answered is: where is maximisation of production likely to lead? This brings us to the fascinating subject of the limits of the economic science, to which the last few paragraphs are dedicated.

"Underdeveloped" and "Developed" Economies

12. The maximisation discussion has hitherto implied the case of an underdeveloped economy. This assumption has now to be stated explicitly by defining the underdeveloped economy as one where the share of investment is less than optimum and/or the level of *A* factors is low (as compared with already achieved standards in other countries). In this sense all existing economies are underdeveloped. And this will not be surprising if one takes into account the transitional state of to-day's world economy.

As the economy expands, the level of *A* factors will rise, and this will change their productive functions. Once poverty economics is left behind, and people are well fed, have reasonable leisure time and enjoy a healthy life, factors *G* and *H* lose their place in *IP* function. They are no longer productive agents but only ends in themselves.

Further, it seems reasonable to assume that after a while every socio-economic system in its development reaches a stage of relative stability and that this applies to the planned economy as well. At this stage economic

[1] The Soviet case was already discussed in an earlier note. The Yugoslav case refers to the period of the first Five Year Plan, when, with the then given state of *A*-factors, as some case studies tend to suggest, too large an investment programme has been carried out to be productively absorbed. Gross investment (housing, etc., excluded) in the period 1947–52 was expanding at the rate of 15% per annum. The share of gross investment in gross product surpassed already in 1951 the mark of 30%, and since then not only the share but even not the absolute amount of annual investment has been achieved again. The labour and capital productivity were low, even declining. Since the end of the first F.Y.P. (1952) the tempo of investing has been gradually slowed down, *A* factors have undergone continual readjustment and the rate of growth of output has, if anything, increased. It may be added that in spite of the restricted expansion of investment since 1952, even to-day, as the annual conference of the Federal Chamber of Industry established in May 1957, manufacturing and mining have less than 80% of the necessary number of skilled workers and only 50% of highly skilled workers, the training of new skilled workers is still lagging behind the *current* needs, and the university output of graduate technicians is only slightly more than one-half of the necessary number (*Borba*, May 7, 1957), although—to illustrate the last statement with two comparisons—in relation to the population there are already twice as many university students in Yugoslavia than, *e.g.*, in Great Britain, and by 1955 the number of technology students had been increased five times as compared with 1939.

and political organisation will be more or less stabilised, all major potential innovations in this sphere exhausted, and the system will perpetuate itself almost automatically. This the factor *O* may be dropped out too.

In this way *A* will be reduced to *Kn*, which remains the only limitational factor of growth. The "intellectual capacity" of a community will provide unsurpassable limits for the productive application of investment and so for the speed of expansion of its economy.

13. The last statement may cause some difficulties. For it is obvious that potential knowledge is unlimited and that, therefore, expenditures on research, however large, must be productive. Therefore *Kn* expenditures would absorb the whole social product, and thus the criterion for the distribution breaks down.

However, there is a fallacy in this reasoning, and it is of exactly the same nature as the apparent contradiction of simultaneously positive and negative *mei* analysed in paragraph 9. It resulted here from the confusion of the ultimate result with the speed of change Skill and knowledge will always be increasing, but the physiological substratum and social habits impose quite definite limits to the *speed* of the change. The increase of production requires continual readaptation of the whole social structure. This may not be evident in a slowly expanding economy. Yet, suppose that the rate of growth is 10%. Then in a generation of two twelve-year periods output would increase 10 times. Our children would have to manipulate an output 100 times as great, and our grandchildren an output 1,000 times as great. An underdeveloped and poor country of to-day would after only seventy years manipulate an annual social income of some $100,000 *per head of population*—do not these figures sound startling? Obviously, there is a physical limit to the rate of expansion to which society is able to adapt itself.

14. The process of development or transition may be advantageously described diagrammatically in the following way:

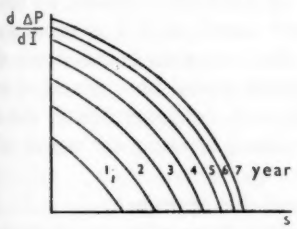


FIG. 3

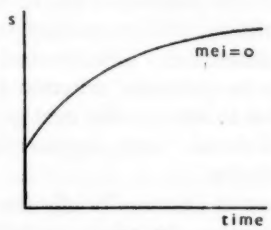


FIG. 4

The Transition from a Low- to a High-investment Economy

The left-hand diagram indicates the increase of the share of productive investment in every successive year (denoted as years 1 to 7). The continual increase of *s* pushes *mei* curve every year to the right. These im-

pulses tend to decrease. If then all *mei* = 0 points are plotted on an *s*-time diagram the resulting curve will increase at a diminishing rate (the right-hand diagram). The rapidly growing first section of the curve (which may have also an S-shaped beginning) shows the transition from the low-investment and unplanned to the high-investment and planned economy. After all economies of adjustment of *I* and various *A* factors are exhausted and *Kn* is left as the only source of the further expansion of *A* the slope of *s* curve will tend to flatten. And as *s* can never reach 100%, the further rise of *s* curve may proceed only at a decreasing rate, *i.e.*, the curve will approach asymptotically a fixed limit in the infinity. In this second stage, after the new level of a high-investment economy has been reached, the share of investment may for all practical purposes be taken as constant.

Here we reach the point where welfare considerations may be profitably introduced into the discussion.

A New Welfare Theory

15. The problem of economic welfare may be approached in basically two different ways: either starting from the assumption of an isolated individual maximising his economic welfare in a static world or from the assumption of the society (or, if this is a better term, the social individual, *economic zoon politikon*) maximising economic welfare in a dynamic world. Theoretical identity of these pairs of concepts, individualist-static and socialist-dynamic, should have been made clear by the implications of the discussion so far. Here it will be derived explicitly with the purpose of showing that the theoretical apparatus developed in this paper makes it possible to construct an ethically neutral criterion for judging the economic desirability of various types of economic systems.

16. The first approach is sometimes stated in the following categorical form: the absolute limit of maximisation of economic welfare of present generation will be reached when the whole social capital is used during this generation's life-time and nothing is left to the next generation; there exists no economic criterion for judging whether and how much of social capital to leave to the next generation. Instead of "generation" the term "individual" may apparently be used without altering the sense of the contention.

Let us examine briefly the implications of this approach.

Suppose the whole social capital inherited from past generations has been used up during the life-time of the present generation. This would mean an immediate increase of consumption equal to previous share of investment in social product, say by 20% of *GSP*. Yet in a rapidly growing economy this increase of consumption will be reached in four or five years anyway, and afterwards it will be greatly surpassed. Thus, from

the point of view of every individual who expects to live longer than five years it would be very foolish indeed to stop investing.

Further, what does the term "generation" mean? Five years of a child who dies in his fifth year or hundred years of a Methuselah? Presumably everybody is expected to maximise his own welfare. But this is possible only within the consumption possibilities provided by the social productive effort manifesting itself as a single integrated force. At the back of the confusion of the relative with the absolute sovereignty of the *homo economicus* lies the naïve preconception of an individual independent of his social environment. In the modern American as well as in the modern Indian society individuals are free to save or to spend their incomes and shape their consumption functions throughout their life-times in whichever way they find fit. The only choice they *cannot* make as independent individual is in fact the *much more basic choice of smaller or larger total income in their life-times*; whatever the Indian does, the income of his American twin is ten or more times higher. In this respect their choice is determined by the society in which they live: by the level and the speed of development of the social productive forces.

Thus individualist approach breaks down completely and we are left to try the second alternative.

17. Granting that individuals are free to choose their occupations and to shape their consumption functions in time, everything outside this decision sphere depends upon social decisions. In the first decision sphere the individual decision-maker may be absolutely independent, in the second he cannot be; this is simply one of the natural properties of the economic system as such, and no amount of economic theorising can alter it. Production and distribution are social processes irreducible to independent individual economic decisions either in the privately or in the socially owned economy. In the former the production function (and thereby the volume of available consumption) depends on more or less haphazard market forces which are likely to lead to boom as well as to slump regardless of our individual intentions. In the latter it is more or less planned with the purpose of achieving certain socially determined aims. The maximum rate of growth of output depends on the expansion of the production capacity of the economy as a whole. Now, if the share of investment is constant and production is always maximised, consumption will be maximised also. And exactly this was the result we wanted to achieve.

In fact, the restrictive assumption of the constant s is not necessary. If the unmanageable concept of "generation" is eliminated, a meaningful basis for welfare maximisation will be provided by the following proposition: Maximisation of welfare of *every* individual means maximisation of the total volume of consumption in the life-time of *any* individual consistent with the similar maximisation of *any other* individual. And this requirement is automatically satisfied once the economy has been pushed on to the path

of maximum growth. For any other policy would be equivalent to the diminution of welfare for some individuals without any increase in welfare for anybody else (see Appendix II).

Conclusions

18. The findings of the analysis may now be summed up. The principle of output maximisation has provided a key for a determinate and practicable solution of the problem of optimum investment and has also provided a basis for an operationally meaningful welfare maximisation in a rationally planned economy. As the economy expands the basic investment decision will soon be reduced to the adjustment of investment to the human capacity to produce inventions and innovations. This will determine the physical upper limit for the rate of growth and will probably cause a relative stabilisation of the share of investment. Judging from the experience so far, this stabilisation for the foreseeable future may be expected to occur at around 30% (possibly more) of productive investment in social product, which will sustain a rate of growth of output of 10% or more per annum.[1] This doubling or trebling of the rate of increase of the population's well-being is what we may expect from the planned economy as compared with economies we used to know. This will mean the exhaustion of the purely economic possibilities of growth, and as such represents the limit to what the economist has to say on this subject.

Branko Horvat

Manchester.

Appendix I

Characteristics of the Model

All important characteristics of the model may easily be derived from the rates of growth of investment and consumption once they are expressed as algebraic functions.

Denote capital coefficient, *i.e.*, the ratio between investment in this year and the resulting increment in output next year as k, investment as I, consumption as C, output as P, rate of growth of investment as r, rate of growth of consumption

[1] It may be worth noting how the naïve though widespread belief, that the rate of growth is bound to decline in a mature economy, proved to be wrong, as the economic history of at least one country, the U.S.S.R., has demonstrated. In the period of the last eighty-five years Soviet economy has experienced the following sequence of the rates of growth of national income: 1870–1900, 3½%; 1885–1913, 4½%; 1928–37, 7%; 1948–55, 9% (M. C. Kaser, "Estimating the Soviet National Income," Economic Journal, 1957, p. 101). The post-war Japanese and German economies have displayed similarly high rates of growth. And in the last eighteen years American economy is expanding at a rate far higher than the past eighty-year average. If the reasoning in the text is correct, the decreasing *rise* of the rate of growth, and not the diminution of the rate of growth itself, is what one may expect in a developed economy. All this obviously on the assumption of no obstacles on the part of the institutional set-up. A separate problem arises from the use of "borrowed technology" in the early stage of the economic development. Once foreign credit in technological knowledge is basically exhausted, this may depressively influence the rate of growth. However, no such phenomenon seems observable in the Soviet case.

as ρ and the share of investment in product as s. Investment in two successive years is given by

$$I_{t-1} = s_{t-1}P_{t-1}$$

$$I_t = s_tP_{t-1}\left(1 + \frac{s_{t-1}}{k}\right)$$

and the rate of growth in any one year t by

$$r_t = \frac{I_t}{I_{t-1}} - 1 = \frac{s_t}{s_{t-1}} + \frac{s_t}{k} - 1 \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

If every year, 1 and 2% respectively are added to s (1) may be expressed in two alternative ways:

$$r_t = \frac{0{\cdot}01}{s_{t-1}} + \frac{s_t}{k} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.1)$$

$$r_t = \frac{0{\cdot}02}{s_{t-1}} + \frac{s_t}{k} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.2)$$

It is evident that the rate of growth of investment changes through time. It will be declining when the following inequality holds good

$$\frac{1}{s_{t-1}} - \frac{1}{s_t} > \frac{1}{k} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

The inequality holds good up to $s = 17\%$ for 1% additions and up to $s = 24\%$ for 2% additions ($k = 3$). The deviations from an average rate of growth are relatively small.

Similarly, consumption in two successive years will be given by

$$C_{t-1} = P_{t-1}(1 - s_{t-1})$$

$$C_t = P_{t-1}\left(1 + \frac{s_{t-1}}{k}\right) - s_tP_{t-1}\left(1 + \frac{s_{t-1}}{k}\right)$$

Therefore $$\rho_t = \frac{C_t}{C_{t-1}} - 1 = \frac{(1 - s_t)\,(k + s_{t-1})}{k(1 - s_{t-1})} - 1 \quad . \quad . \quad . \quad (3)$$

The *volume* of consumption will be normally increasing. The condition for this is that the increment of product is not exhausted by the increment of investment

$$\Delta P_t > \Delta I_t$$

$$\Delta P_t = \frac{s_{t-1}}{k}P_{t-1}$$

$$\Delta I_t = s_tP_{t-1}\left(1 + \frac{s_{t-1}}{k}\right) - s_{t-1}P_{t-1}$$

$$s_{t-1}(1 - s_t + k) > s_tk \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

If annual addition to s is respectively 1 and 2% (4) may be expressed as

$$s_{t-1}(0{\cdot}99 - s_{t-1}) > 0{\cdot}01k \quad . \quad . \quad . \quad . \quad . \quad (4.1)$$

$$s_{t-1}(0{\cdot}98 - s_{t-1}) > 0{\cdot}02k \quad . \quad . \quad . \quad . \quad . \quad (4.2)$$

or, as an approximation

$$100\,s_{t-1} > k \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4.1.1)$$

$$100\,s_{t-1} > 2k \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4.2.2)$$

This means that, if $k = 3$, starting share of investment must be greater than 3% in the first case and more than 6% in the second case to prevent consumption falling absolutely in the next year.

The *rate of growth* of consumption is constantly increasing for all feasible values of s and k as may easily be found by putting $p_{t+1} > p_t$.

Realistic changes in the assumptions of the model will only slightly change the results described in the text. Thus the smaller the value of capital coefficient k, the greater, *ceteris paribus*, both rates of growth will be. Further, the smaller the k, the smaller the original share of investment—and the smaller annual additions to it—the sooner the level of consumption of the steady growth pattern I will be reached. If k decreases from 3 to 2, or if the starting share of investment is $s = 9\%$ instead of $s = 15\%$, or if annual additions to investment are 1% instead of 2%, the level of the consumption of the pattern I will generally be reached one to two years earlier.

Appendix II

Equivalence Theorem

In paragraph 17 it was contended that any movement off the path of maximum growth is equivalent to the diminution of welfare for some individuals without any increase in welfare for anybody else. Here a formal (logical) proof for the contention will be supplied.

The decision to push the economy on to the path of maximum growth is a once-for-all decision. Therefore generalisations about it, in the traditional manner, do not seem to have much sense. Probably nearest to common sense would be to ask the referendum-question as it was formulated in paragraph 11. But even such a question is still much too formal to have a real value for the economic theory and policy. This is so because the affirmative answer implies not simply a choice with respect to economic welfare but also a choice with respect to different socio-economic institutions; to achieve maximum growth the economy has to be planned. However, once this basic decision has been made and the economy starts moving along the path of maximum growth—and this has been the assumption of this paper—formal generalisations about economic choices have sense and, moreover, they lead to some interesting new results as compared with the traditional welfare theory.

The choice we face in such an economy is formally the same as before: either to invest more or to invest less as compared with the original investment pattern. The first alternative is dismissed at once because it leads to negative increments in product, with a consequence that everybody loses and nobody gains. The second alternative implies that *IP* has been shifted to maximise consumption in a particular sub-period. In this case some individuals would gain at the expense of others and at the expense of their own future consumption. In physical terms this gain is always incomparably smaller than the resulting loss, because the gain, being temporary, is finite, and the loss, being permanent and, moreover, expanding, is infinite. The problem is a little more complex in utility terms.

Traditional approach would imply that saving has to be pushed to the point where marginal disutility of saving becomes equal to the marginal utility of investment. In the economy on the maximum growth path marginal productivity of investment (*mei*) is zero. With $mei = 0$ marginal utility of investment (*mu*) is zero too. If this is so, marginal disutility of saving (*md*) must also be zero at this point. If it were positive, it would be necessary to reduce investment to make $mei > 0$ and $mu = md$. This conclusion applies to every moment of time. Therefore it would never be possible to achieve maximum rate of growth. But this would contradict our starting assumption.

Thus the first choice of maximum growth implies that marginal disutility of saving is zero. If in a growing economy $md = 0$ at one time it has to be zero for ever, because increasing consumption implies decreasing marginal disutility of saving and, by definition, *md* cannot diminish below zero (and even if it could, this would not change the final conclusion). Therefore, if maximum growth alternative is once chosen, it will continue to be chosen. Every other policy—the restriction or the expansion of investment as compared with the optimum rate—brings about losses for some individuals without any gain for anyone else.

If the foregoing reasoning is correct, the theorem will have two important implications. First, in a situation of maximum growth traditional utility considerations become irrelevant. And, second, once the first choice of optimum $\mathcal{IP}$ is made, traditional utility logic becomes invalid: disutility of saving does not change (continuously) with the welfare of the community and therefore $md = 0$, and cannot decrease with increasing consumption. These results, being mere logic, are perfectly general. If in some countries—for some *historical* reasons or others—the decisive first choice has not yet been made, this cannot change the *logical* structure of the set of concepts used. It suffices to accept that the initial decisive choice is feasible and all consequences follow at once as generally valid. Contrary to traditional assumptions, marginal disutility of saving is *not always* positive and is *not always* decreasing with increasing consumption. If there is no regularity, no *a priori* theory can be developed and all statements become tautologies: the choice has been made because it has been preferred. If there is a regularity, then $md = 0$ is a universal characteristic of utility function, and as such renders utility considerations irrelevant. In fact, what appears to be wrong is not the concept of utility as such but the mode of its marginalist application in the field of macroeconomic investment choices.

Finally, it is worth noting how, as a by-product of this analysis, the well known von Mises–von Hayek proposition about rational economic choice in two alternative economic systems will have to be reversed: consistent investment choices appear now to be impossible in the unplanned economy. If it is chosen to achieve maximum growth of consumption, planning is indispensable by definition. If the choice is formulated in the traditional manner a certain regularity in investment will have to be observed; in fact, the share of investment will have to be continuously increasing. The reasons are the following ones. Increasing consumption implies decreasing marginal disutility of saving, this is reinforced if there is an egalitarian tendency in the distribution of income, and decreasing capital coefficient implies increasing marginal utility of investment (*ceteris paribus*). Now, increasing consumption, egalitarian tendencies and decreasing capital coefficient have been observed, but no appropriate regularity in investment. On the contrary, it fluctuated widely and irregularly. Thus if we reject the obviously absurd assumption that investment fluctuations reflect changes in tastes, we are left to conclude that *rational* choice with respect to the amount of investment is possible only in a planned economy. And this choice is the basic economic choice because it determines the rate of increase of consumption.

AN ECONOMIC ANALYSIS OF FIXED INVESTMENT

IT would be a coincidence if, in investigations into such problems as the causes of economic growth, the existing classifications, as such, of fixed investment could serve anything more than a limited purpose. For the most part, they consist of concrete divisions (such as machinery and buildings, and using industries) which were primarily designed to satisfy statistical requirements; and it is the statistical data collated in accordance with these concrete divisions, rather than any analytical concepts underlying their structure, which give them practical value.

Concrete characteristics, however, are not the only bases of classifying fixed investment. There are two abstract basic characteristics which would provide categories of some theoretical independence and therefore of relevance to economic analysis, viz., the various ways in which new investment creates, or is intended to create, yield, and the various ways in which it affects the total stock of fixed capital.

I

Potentially, a new capital work creates yield in one of two broad ways: (*a*) by expanding capacity, and (*b*) by reducing costs. We thus have a primary division of new capital works, and therefore of fixed investment, into two main groups, which we may conveniently call the broad yield-categories.[1] Every new capital work also affects the existing stock of the firm's fixed capital in one of three ways: (*a*) by addition or development, (*b*) by replacement or renewal, and (*c*) by transferring or displacing some of it by reorganisation. Each of the two broad yield-categories may be subdivided by reference to these three capital-stock categories; and so we have a basic analytical classification of new fixed capital consisting of six categories, viz.:

Expansion-development	Saving-development
Expansion-renewal	Saving-renewal
Expansion-reorganisation	Saving-reorganisation

There is a seventh category: the renewal of like for like involving neither expansion nor saving; but in practice it is not of much consequence, since the renewal of fixed assets is nearly always an occasion for improvement of some sort.

[1] Not all capital works are designed to create yield; apart from government-sponsored works, such as roads and ordnance factories, there are a few whose purpose is to improve the conditions of safety, hygiene and the like. These are left out of account.

Renewal needs to be interpreted broadly. For our purpose, the term can be conveniently extended to include the provision of new assets which displace, as well as those which replace, old assets, such, for instance, as a plastics-moulding machine for producing car-body parts in place of a press for producing functionally the same parts from steel sheet. Function, however broadly we interpret it, is the criterion of renewal, and not—for instance—physical position. New assets designed to produce goods or services functionally different from the products of any assets to be displaced to make room for them constitute development.

Reorganisation works consist of the rearranging of existing machinery, plant, stores and offices designed to improve the flow of raw materials, components, partly finished goods and packing materials through the factory. They include such schemes as " the streamlining of group production and amalgamation of smaller units to achieve the benefits of volume production and bulk distribution," [1] and those physical reorganisations which result from the application of such methods of investigation as Work Study.[2] Expenditure on schemes of this kind is fixed investment, whether it is charged to capital account or not.

Expansion is defined as the growth of productive capacity; and *development* as capital formation. There can be expansion without development, and development without expansion, as the classification shows. Expansion-development and expansion-reorganisation are the only kinds of work which are always deliberately designed to increase productive capacity. The purpose of renewal works is primarily to maintain capacity. However, it does happen that a firm needing to expand somewhat may be able to do so by replacing some existing assets with new assets of a greater capacity at a price no higher than the current replacement cost of the assets to be displaced. This may take place at the end of the book life. But premature renewal with the main object of increasing productive capacity is not uncommon; and then we have pure expansion-renewals. The category also embraces the renewal in similar circumstances of assets which have reached the end of their book life, provided it is the firm's intention to employ the increment of capacity in order to increase its gross revenue.

The categories are not mutually exclusive, unless we employ some such device as *major effect*, in the same way as the *Standard Industrial Classification* defines industrial establishments by reference to major product or major activity. For our purpose this is not very important, and less so since probably most new works fall into one or another of the six categories without overlap.

For technical accounting reasons, we can scarcely hope to have accurate statistics of investment expenditure under each category; but a notional

[1] *Financial Times*, May 29, 1957.

[2] See " Work Study To-day," by Sir Ewart Smith, *Financial Times*, July 22, 1957; and an article by John Davy in *The Observer* of January 26, 1958.

estimate of the normal percentage distribution may not be without value. According to the National Income blue book, rather more than 50% of gross capital formation in recent years has gone to the maintenance of the stock of capital goods in the country. In the long run, there is a displacement of assets which remain unreplaced, so that of the actual total expenditure on the provision of fixed assets, not more than 50% may be on renewal account, the remainder being defined as development for our purpose. Apparently, the blue-book figures do not take account of reorganisation expenditure, even that which takes place in association with renewal or development works. We can therefore only guess the relative value. Furthermore, we have no statistical information which would give us a clue to the relative values of expansion and saving works. The following is based partly on blue-book data and partly on personal experience and observation:

Estimated Percentage Distribution of Fixed-investment Expenditure

	Total.	Expansion.	Saving.
Total	100	45	55
Development works . . .	35	20	15
Renewal works	35	10	25
Reorganisation works . . .	30	15	15

It should be emphasised that these estimates are very general averages; to apply them to any particular year would in any event beg one of the main questions of this paper.

II

The six categories can be expanded into a more useful analytical classification by an analysis or breakdown of the two broad yield-categories into a number of narrower ones. Where appropriate, the subdivision of each into the three capital-stock categories can be retained.

In assessing the anticipated yield of new works, we can take it that annual costs are a primary consideration in all cases. For any given size of plant, they can be regarded for convenience as falling into two main classes, viz., (*a*) time-elements, which are incurred largely in the provision and maintenance of new fixed assets, or in the transfer or reorganisation of old assets, or which are saved in the displacement of old assets, such items of cost being, for instance, interest, depreciation, local rates, and the rent of land and buildings; and (*b*) operating elements, which are incurred in the running of new assets or saved in ceasing to run old assets, such items of cost being, for instance, materials, fuel, power, and direct and some indirect labour.

This division of annual costs should not be confused with the division into overhead and direct costs; all time costs are overheads, but not all

operating costs are direct costs. Nor should it be confused in any way with a division into variable and non-variable costs as applied to the effect on annual costs of changes in the arrangement or stock of fixed capital. In assessing the anticipated yield of new works, it is sometimes the practice to take account of the variable annual costs only, the object being to avoid inflating or deflating the yield of new works by some cost-accounting fiction which may assume that the work will result in a change in, for instance, the general manager's salary. Sometimes we shall need to take account of the total cost.

Annual costs are not necessarily the costs incurred in any one year. They are the costs of reproducing the quantity sold or to be sold in a year under present or prospective extraneous conditions, extraneous conditions being those which exist independently of the new work, such as wage-rates and material prices. Whisky is usually matured in bond for three years or longer. The costs with which we would be concerned are not the actual costs of producing and storing the whisky which is to be produced, or expected to be produced, say, next year. They are the estimated annual costs, including warehousing and the cost of financing the stocking in bond, under the extraneous conditions which are expected to prevail next year, of the quantity to be sold. Where an anticipated change in sales has to be taken into account in assessing the yield of a new work, we are thus able to make a direct comparison between the annual costs and the receipts from sales under old and new conditions.

The total annual cost, T, and the annual gross revenue from sales, G, are taken as being dependent on the quantity, q, sold or expected to be sold in a year. It is safe to assume, in most cases at any rate, that the elasticity of demand, e, for the product, and—within the normal capacity of the plant—the marginal cost, a, are constants over any range of sales or output up to about 2 : 3. The normal annual cost function may therefore be written:

$$T = aq + b \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

where aq represents the annual operating costs and b the time element.[1] The form of the gross-revenue function is derived from the constant-elasticity demand function, $q = kp^{-e}$, where p is the price, and k a constant, that is:

$$G = pq = Kq^{1-1/e} \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

[1] Of the new capital works whose financial results I have been concerned in assessing, the cost functions for output rates within the normal capacity of the plant have always been linear, though admittedly, this may have been apparent rather than real owing to the practical difficulties of obtaining a measure of any systematic departure from linearity. It is known that in some industries the marginal unit labour cost at the firm tends to decrease, *cet. par.*, as the rates of output increase, and vice versa; but these are generally over very wide ranges of output in which the plant itself expands and contracts. See, for example, my " Productivity in the Wartime Aircraft Industry," *Aircraft Engineering*, June 1957.

K being equal to $k^{1/e}$. The vertical distance between the annual cost and annual gross revenue curves for any given value of q is the measure of the net revenue, which may be defined as that part of the annual profit, distributed and undistributed, which accrues gross of tax to the proprietors or the holders of Preference and Ordinary Stock and Shares in the company. The maximum net revenue is equal to the vertical distance between the two curves where they are parallel, that is, where—

$$p = \frac{ae}{e-1} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

which is the optimum price.[1] Corresponding to the maximum net revenue, the gross revenue may therefore be written—

$$G = \frac{qae}{e-1} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

and the quantity sold—

$$q = k\left(\frac{ae}{e-1}\right)^{-e} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

which may be substituted for q in equation (4) to give the optimum gross revenue as a function of the marginal cost and the elasticity of demand. Writing M for the maximum net revenue, we have—

$$M = \frac{aq}{e-1} - b \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

that is, after substituting for q—

$$M = ke^{-e}\left(\frac{a}{e-1}\right)^{1-e} - b \quad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

Subscripts 1 and 2 will be used to denote present and prospective, or old and new, conditions respectively.

Expansion works generally result in an increase in the time costs, that is, $b_2 > b_1$. Exceptions are largely confined to expansion-renewal works. Three practical grounds exist for expansion works: (*a*) where the firm anticipates an increase in the level of demand for its products, and the capacity of the existing plant is inadequate to meet it; (*b*) where the demand at the optimum price already exceeds the normal capacity of the existing plant; and (*c*) where it is possible to introduce a technical development which would so reduce the marginal cost that the demand at the lower

[1] An analytical proof of the optimum-price formula, equation (3), is given in my *Cost, Demand and Net Revenue Analysis* (London, 1938). A geometric, more general and more satisfactory proof appears in *The Economics of Imperfect Competition*, by Joan Robinson.

optimum price would exceed the normal capacity of the unexpanded plant. Every expansion scheme, however, must justify any increase in the time costs which it may incur.

Where the new work does not involve a change in the marginal cost, its net financial result is—

$$M_2 - M_1 = \frac{a(q_2 - q_1)}{e - 1} + b_1 - b_2 \quad . \quad . \quad . \quad (8)$$

that is, if the proposed expansion work is to prove justified, the time cost under the new conditions, b_2, would not exceed—

$$\frac{a(q_2 - q_1)}{e - 1} + b_1$$

Where there is an anticipated change in the marginal cost, the net financial result is equal to—

$$M_2 - M_1 = \frac{a_2q_2 - a_1q_1}{e - 1} + b_1 - b_2 \quad . \quad . \quad . \quad (9)$$

These two equations hold good whether the cost curves are linear or not, but where they are not, b_1 and b_2 are not the values of the time costs, but serve to show the elevation of the curves at a_1 and a_2 by indicating where the tangents to the cost curves at these two points cut the y-axis. In practice, the firm may, in the circumstances of a rise in the level of demand, increase its net revenue to a new maximum without expanding the plant merely by increasing output beyond the normal capacity of the plant until the cost curve has curled upward to a point corresponding to the economic capacity of the plant, which is the output corresponding to the vertical which passes through the upward-curling cost curve and the new gross-revenue curve where they are parallel. The rise in the level of demand would thus be met partly by an increase in the supply and partly by a rise in the price. In theory, a level of demand tending to rise beyond the normal capacity of the plant would best be exploited by a series of small expansion works contrived in such a way as to cause the normal capacity of the plant to expand at a rate just sufficient to keep pace with the increasing demand.

Expansion works in general nearly always embody new technological improvements, with the result that for the plant as a whole the marginal cost under the new conditions is lower than that under the old, and therefore the optimum price is also lower. In reality, then, equation (9) is more generally applicable than equation (8).

It is also equation (9) which is the ultimate criterion applicable to the third ground of justification for expansion works. This ground consists of a decline in the marginal cost of the final product resulting from improve-

ments of the existing plant. A small saving-renewal work may initiate an expansion work of this kind; but I would say it is more likely to be a large-scale renewal scheme or renewal and saving-development scheme, combined perhaps into a single major new work under a general reorganisation. But an expansion-reorganisation work alone, with possibly a small-scale renewal programme, can sometimes be effective enough to lead to a significant reduction in the marginal cost.

As equations (3) and (5) show, the optimum price and the corresponding quantity in demand can both be expressed as functions of a and e. Since a is now fairly widely recognised in industry as a valuable product of the costing system, the main practical difficulty in determining the maximum obtainable additional net revenue from expansion schemes is the evaluation of e. Probably many firms tend to strike a reasonable approximation to the optimum price and the corresponding demand more by trial and error than by using a mathematical formula. The value in price-fixing policy of a knowledge of the elasticity of demand is little appreciated, and where the concept is understood, it is quite likely regarded as rather academic. That the optimum price increases and decreases in the same proportion as the marginal cost may not only be appreciated at some firms, but also applied in practice.

All saving works designed to reduce the marginal cost of the final product of the firm potentially affect the firm's gross revenue by decreasing the optimum price. Purely saving works of this kind are necessarily confined to those where the demand at the new or prospective optimum price can be met by the existing plant without expansion. The criterion of efficiency is equation (9), but b_2 may be greater or less than, or equal to b_1; although where it is not greater, the work is bound to yield an additional net revenue provided a rational pricing-policy is pursued.

The only other types of saving work of any importance which affect the gross revenue are best described as loss-cutting. They consist of reorganisation schemes designed to reap the maximum benefit from a curtailment of output of a line which has become unprofitable in general or in a particular market. Perhaps *reorganisation* is not quite apt: strictly, such schemes are capital-displacement or contraction works—negative development. But the investment expenditure on them is largely devoted to the physical transfer of fixed assets, that is, to the recovery of usable assets from the abandoned plant either to sell of for displacing similar but life-expired or less-modern assets in a profitable part of the plant.

The purest forms of saving works are those which reduce the time costs without causing a change in the marginal cost. In these cases pricing policy is not affected, and there is therefore no consequential change in the gross revenue. The reduction in the annual time cost is the measure of the additional net revenue resulting from such works, and it applies to all rates of output.

III

A more detailed classification of fixed investment can now be constructed:

Expansion-	Saving-
Development—	Development—
$a_2 = a_1$	$a_2 < a_1$
$a_2 < a_1$	$b_2 < b_1$
Renewal—	Renewal—
$a_2 < a_1$	$a_2 < a_1$
Reorganisation—	$b_2 < b_1$
$a_2 = a_1$	Reorganisation—
$a_2 < a_1$	$a_2 < a_1$
	$b_2 < b_1$

The marginal cost, a, and the time cost, b, may apply to the firm's intermediate products quite independently of the final products. It is true that in manufacturing industry the marginal cost of an intermediate product usually forms part of the marginal cost of the final product; but it is not invariably so. Paper-work in the office, for instance, is often an exception; and in the service industries it is not uncommon to find an intermediate product whose operating cost relative to itself is an appreciable proportion of its total annual cost, which, relative to the final product, may be almost entirely a time element. In assessing the financial results of new works, the distinction is important. Generally, for our broader purpose, the analysis of annual costs into marginal and time elements need be considered in respect of the final product only.

IV

Throughout all phases of a boom, fixed investment tends to become concentrated upon expansion-development. Expansion-renewals and expansion-reorganisation are not in themselves effective enough to interest business-men when expectations are high, and for the most part, they are ultimately taken care of in major schemes of expansion in which development plays the principal role.

In the initial phase of a boom, expansion-development may be formed almost entirely from assets originally ordered under renewal programmes; that is, actual expansion is achieved less by increasing the acquisition of new assets than by reducing the rate of displacement of old assets. Most assets ordered under saving-development projects—and especially those (such as office machinery) intended for ancillary activities—could scarcely be used for any purpose other than the one they were originally intended for. In the early phases of a boom, however, the stimulus to expand creates a situation

in which little time and money can be spared for promoting saving works of any kind.

During the second phase, the earlier increase in the demand for new fixed assets would by now be resulting in an increase in the supply. The accumulation of arrears of renewals has become appreciable, and the pressure of rising material prices brings about a fresh interest in expansion-renewals, and also to some extent in saving-renewals for activities whose expansion is not essential to the growth of the business. Efforts to clear the accumulation of arrears of renewals may provide additional stimulus to the boom; and although an ever-changing pool of arrears may remain, like a pool in a river, the renewal demand for new assets ultimately tends to become a fairly stable addition to the increased expansion-development demand.

The third and last phase begins when the boom has reached a state of true inflation. Then additional labour becomes difficult to obtain; and further expansion largely depends upon the success of labour-saving schemes in the existing plant, schemes which the firm may justify, not on a direct saving in the annual costs of production, but on the quantity of labour they release for operating expansion works as they are brought into use. Labour saving by the firm thus tends to become an end in itself without reference to the economic tests normally applied to new capital works. Labour-saving works and expansion-development works come to depend for their success upon each other; and if the latter fail, or if business expectations turn so much less optimistic that the expansion schemes fall through, the firm will have made its cost structure more inflexible to no purpose by increasing the time costs by an annual amount in excess of the annual saving in operating costs. Labour-saving works of this kind can rarely have a long-period economic justification, any more than expansion-development works whose success depends upon a prolonged period of inflation.

In the first phase of the ensuing slump the cancellations of orders for fixed capital assets would not at first be confined to those intended for expansion, but would tend to embrace those ordered for saving schemes as well. Capital expenditure might be almost entirely limited to saving-reorganisations designed as far as possible to cut the time costs, and to clear the pool of arrears of renewals with existing assets which would otherwise have been declared redundant.

After this first phase, unit-cost reduction becomes the paramount need, and orders for assets under the headings of saving-development and saving-renewal would begin to flow again, probably reaching a rate in excess of that of the boom period. The promotion of saving-reorganisation schemes would continue, but they would be now less concerned with reducing time costs and more with reducing operating costs than in the initial phase.

These, briefly stated, are the changes which one may expect to take place in the several categories of fixed investment—other things being equal—

during the progress of a boom and a slump. Investment in expansion works is a function of business expectations, and it is usual to explain the change from slump to boom and boom to slump in those terms. Investment in saving works is also to some extent a function of business expectations, but probably in the inverse way except in true inflation.

In saving-development and saving-renewals the principal factor is technological progress; and in saving-reorganisation it is the progress made in mechanical-handling plant and in the physical aids to industrial control (both of which are technological), and in those sets of principles of works organisation the application of which came to be generally known in the nineteen-thirties as " rationalisation."

An increase in the rate of technological progress will always tend in any economic conditions to stimulate expansion in the rate of investment in saving works. During a boom, the adoption of the newest technology in expansion works is the common practice. In some cases it has to be applied to the whole of the productive unit or not at all.[1] A revolutionary improvement in production processes will always have attractions for business-men, even when rapid expansion is the order of the day.

But it is during periods of slump that rapid technical progress is most welcomed by industry, and especially by those firms which have internal sources of finance, or which remain otherwise credit-worthy. At such times, when cost-reduction is the paramount consideration, a proved revolutionary advance in production processes and equipment could very well lead to a rate of investment in saving works great enough to bring about an upward turn of the trade cycle.

V

The economic analysis of fixed investment has a relevance to long-term trends, and may suggest a gradual change, perhaps for the worse, in the character of short-term movements.

Saving works which effect a reduction in the marginal cost of the firm's final product at the expense of an increase in the annual time cost set to the rate of output an economic minimum. This minimum, below which it would be more profitable to retain the original plant, is determined by the point of intersection of the new total-annual-cost curve and the old one. The opposite is true of saving works which effect a reduction in the annual time cost at the expense of an increase in the marginal cost: they set to the rate of output an economic maximum. Most saving works fall into the former category; and many expansion works also result in a fall in the marginal

[1] An example is the pre-war electrification of machine shops, that is, the fitting of electric motors to individual machine-tools, looms, etc., in place of belt drives from a shaft propelled by a steam-engine. The application during the present decade of electronic control in factories probably falls into the same category. Such new works are saving-renewals or saving-development rather than expansion-development.

cost and a rise in the time cost. It follows that the cost structure of industry is becoming more insensitive to changes in the rate of output.

As the marginal cost declines with the introduction of successive new-works schemes and approaches the bare unit cost of materials, the former type of saving work will have less scope, and the latter will grow in importance. And pricing-policy will then be less affected by falling marginal costs than by rising demand elasticities.

Technology has been encroaching on some items of time cost for many years. But probably by far the most important time-cost savers are new capital works which result in an increase in the rate of output per unit of fixed capital. For works of this kind, there seems to be unlimited scope.

VI

One matter remains to be dealt with. If we accept investment control as an instrument of national economic policy, how, if at all, could the control authority exploit this analysis of fixed investment?

Of the several categories of new capital works, expansion-development is the one which responds most to changes in business confidence. It does not follow, however, that the investment-control authority should concentrate entirely on curtailing expansion-development in times of boom, and on encouraging it (by subsidy, for instance) in times of slump. In general, it may be considered to be in the common interest to do so; but there may sometimes be good reason for exercising a measure of control over renewal and reorganisation schemes and saving-development schemes, as well as over expansion-development. May there not be, for instance, in a time of boom some expansion-development proposals in excess of the equilibrium requirement more worthy than some of the proposals under other categories, and in a time of slump, some expansion-development proposals less worthy of official encouragement than some proposals under the other categories? To some extent, the answer turns on the official attitude to labour productivity.

During the phases of a boom, the rate of increase in productivity as a whole tends to decline as a result of the retention in service of assets due for renewal, of business-men's preoccupation with expansion to the neglect of saving schemes, and, when true inflation is reached, of the introduction of labour-saving schemes which in themselves are uneconomic, and which merely serve to transfer the onus of finding additional labour to the capital-goods manufacturers. There seems to be a dilemma here; for the more the control authority restricts expansion-development, the more likely will business-men retain obsolete and outworn assets.

On the whole, it seems that the authority should take the long view, and give its full support at all times to genuine saving-works and to expansion-renewal works, and withhold its licence from the promoters of uneconomic

labour-saving schemes where it can detect them. Only expansion-development and expansion-reorganisation are left for the authority to control by restrictive licensing in times of boom.

There is, however, still some choice within the categories. When the control authority is weighing schemes which involve reductions in marginal costs against those which involve reductions in time costs, it may work to the principle that industrial costs should be made and kept as flexible as possible, and so support the latter at the expense of the former. On the other hand, it may work to the principle that prices to consumers should be kept to a minimum at all times, and so support the former at the expense of the latter. It may, of course, combine the two principles, and support schemes which involve reductions in both the marginal and the time costs at the expense of all others.

But the over-riding principle governing control policy may be to obtain the maximum results for the minimum effort. This would mean that the larger new capital works would receive more attention than the smaller ones—undoubtedly a good policy provided it were not carried so far that the smaller works passed through the control net unnoticed. In my experience, integrated renewal programmes are sometimes large, and so also are a few reorganisation schemes. But in times of boom, by far the greatest number of large capital works falls into the expansion-development category.

Other criteria of control under a central authority, such as locality, types of product and the additional labour required, have been recognised for a long time. It is not suggested that the yield and capital-stock categories should take their place. There seems to be good reason, however, for taking them into account as supplementary criteria.

E. J. Broster

London.

REVIEWS

Frank H. Knight on the History and Method of Economics. Essays selected by WILLIAM L. LETWIN and ALEXANDER J. MORIN. (Chicago: University of Chicago Press (London: Cambridge University Press), 1956. Pp. vii + 309. 45*s*.)

RICHES here indeed—but how does one review them in a little room? Economy says select and order. And this guide has been followed by those who chose these essays as a proper seventieth birthday gift; for who could be more worthy of Professor Knight than Frank H. Knight himself? The editors have chosen by their author's main interests—economic theory and its history (Parts I and II), theory of method in the social sciences (Part III) and the reasons which justify a liberal society (Part IV). I shall follow these divisions; but start with two general reflections.

First, we have here to do with the supreme all-rounder of our day. Not only can he play all the parts, and conduct his own orchestra, but he can also play any one part as well as any of the specialists—economics, epistemology, science, mathematics, history, sociology, philosophy. I had recently to read in sequence the major works of John Stuart Mill. This gave the impression of a mind of higher power than the accustomed run, in ability to absorb all the disciplines and play on all the organ stops together. This impression these essays also constantly give—and the tunes are livelier. Then, we should here also recognise perhaps the most dedicated rationalist of our day. In him the glorious Enlightenment lives again, but with policies more positive than in its eighteenth-century masters. " In a sense, truth includes all other values . . . All truth . . . is arrived at by co-operation among individuals acting freely and in a spirit of ethical, even religious, integrity." This is Knight's religion.

The economic theme shines resplendent in " The Ricardian Theory of Production and Distribution " (II), to which should be added the review of Wicksteed's *Commonsense of Political Economy* (IV), and in " The Business Cycle, Interest and Money " (IX). The first is too little known, possibly because its title underplays its amplitude. Knight no doubt wishes to expose the error so obvious in Ricardo—his failure to push the economic principle from production costs through to distribution theory. But this article does much more. It offers a constructive estimate of the classics (doing most sensitive justice to Adam Smith), and through them traces the line of growth in the theory of substitution till, in Knight's own hands, it reaches maturity. Here indeed Knight's rationalism is revealed; he pushes the economic principle to its marginal limits. At this level, Knight sees all prices as mutually self-determining, in space, time and in psychology as choice

between alternatives. The subjects of all prices are reduced to a common denominator as and because they are all in fact *services*, and that in the immediate moment of consciousness or continuous present. This is the raw material of our economic traffic, and on it the economic principle works. "Streams of services . . . are the things valued and exchanged in the market," and each factor is so valued so far as it yields this stream. At each moment we value the support from "land," the immediate produce of capital goods or the services of our fellows. Capital and wealth are secondary derived (or expected) money aggregates of these services. Rent can be translated into capital yield by converting the original cost into the present cost of an equal stream (through allowing for maintenance cost). On labour services Knight seems to your reviewer not to show quite his usual rigour:

> "All this does not mean that the human being as a source of economic services can be treated in theory as wealth or capital, or additions to human productive capacity treated as product, or the act of making them as production, as in the case of material wealth. There is a fundamental difference, in the form of a somewhat paradoxical limitation to the individual's ownership of himself. The principle of inalienable rights, recognised in all free societies means not merely that one cannot sell himself outright, but that one cannot so much as give a valid lien on his services or make an enforceable contract to deliver them for any considerable time in the future. In other words, he cannot capitalise his earning capacity. Having no economic value to anyone but himself, he has in effect none at all" (p. 52).

Distrust paradox! The following may be a personal view, it is not indeed orthodox. But do we not all make contracts over time for our "flows of services," for which we accept responsibility? And have we not wage and salary rates, and life tables, by which to estimate their capital value? Are such estimates different in economic kind (especially as to invested skills and rents) from machinery? And do they not remove the anomalies of plumbers who have no capital and surgeons devoid of wealth? Knight in other passages shows sympathy with this further application of the economic principle. "In free society, economic agencies, or resources, include human beings . . ." (p. 44, cf. p. 100, footnote).

However this may be, Knight's "flow of services" formula shows its power especially in an unusually concise and stimulating statement of the determination of interest rates. The source of value being the flow of all the services, the value of capital springs from the greater produce it affords; and the rate of interest simply reflects this growing produce in the moving present. This is, of course, a measure of long-period trends (Knight's work on uncertainty needs no comment here). "Capital is the productive capacity of [concrete] things, except that it is measured by salable value at a moment of time, while the product of capital is a perpetual flow or stream of

value" (p. 77). Knight indeed regards capital as of indefinite life: as long as progress continues, capital is continuously replaced or improved, indeed the yield of any capital item cannot be defined until maintenance cost has been deducted.

Ignoring uncertainty, then (" there is no clear meaning of rational behaviour in the face of uncertainty ") investment proceeds up to the point where its accumulated costs equal the discounted value of its expected yields, both accumulations and discounts being estimated at the present rate of interest, as it is the present alternatives we are measuring. In this way supply and demand for capital are fixed. And, just because capital is productive, the demand for capital exceeds its supply, and the rate of interest is always positive. The scope for the productive use of capital is in fact unlimited (barring uncertainty), whereas the preference for saving over consumption clearly is not.

From this it will appear that Knight's and Keynes' theories of interest are more complements than antagonists, the first dealing with the long-period trend and source of interest, the latter with its short-period market determination. These essays being selected, there is inevitably some risk of distortion, and reviewers have inevitably seized on some rather highly coloured remarks on Keynes (and especially Keynesians) (*e.g.*, pp. 220, 252). Yet it is easy to find fully argued passages in which Knight shows agreement with Keynes' hoarding and interest theory, so far as this deals with conditions of " disturbance," as Keynes certainly did. One recalls passages in the second preface to *Risk, Uncertainty and Profit*, and in " Capital, Time and the Interest Rate " in *Economica* 1934. Article IX of the present collection—" The Business Cycle, Interest and Money "—is a fine and welcome example. Thus, dealing with the cycle's falling trend, Knight says, " the motive for holding money idle . . . is speculation for a rise in its future value " (p. 210, cf. pp. 213, 215). He adds (footnote to p. 215) that " a relative stabilisation with a considerable amount of unemployed labour . . . and a great plethora of idle funds " can in fact obtain. But in Knight's theory monetary and other derangements are treated as distorting forces, whereas to Keynes between the wars they seemed endemic and permanent. The further cleavage, such as it was, sprang from temperament and difference in political views. Knight has always distrusted " powers " —" I am reluctant to believe in doing good with power. With William James, I incline to the side of ' the slow and silent forces,' slow as in all conscience they are—and though time is fleeting " (p. 281). To Keynes in the 'twenties and 'thirties it was indeed fleeting. The " powers " seemed the only hope, if they could be advised. We can see the rightness of each, in due place, each a liberal of genius.

Knight's business cycles appear as disturbances within his long-period model. In one sense they approach reality nearer than most models. Knight's first training was in science, and often in these papers one hears

the scientist speaking in a way at once strange and compelling to British ears. So, here, he sees equilibrium not as static, but as the regularity of oscillation (or regular lags), for it is oscillation we always find in reality; whereas a disturbed oscillation reflects the cycles of business uncertainty. So what we have to explain is not oscillation, but these excessive movements away from regular oscillation, and how to control them. Indeed, Knight's scientific realism leads him, as it seems to me, to the right criticism of the rather loose category " Statics and Dynamics " (Art. VIII), as applied to economic processes. Thus " phenomena of growth or change " are described as dynamic in contrast with the " static " state in which they are absent. Knight says—

> " this is misleading, because entirely different from the meaning of the terms ' statics ' and ' dynamics ' in the field of theoretical mechanics, from which they are taken. Dynamics deals with motion, and the working of a stationary economic system involves the analogue of motion. The process of establishing a moving equilibrium under stationary conditions might more reasonably be called economic dynamics. Changes in these given conditions (wants, resources and technology), are analogous with nothing dealt with in the science of mechanics and should be designated by some other term, such as ' historical ' or ' evolutionary ' economics " (p. 55 note).

Here we note Knight's sense of the uniqueness of human experience. That reflects his ethical and social theory, to which we next turn.

Knight's insistence on the uniqueness of human experience is the core of the five essays in Part III. It is usual in science to separate the animate from the inanimate, but then one treats man as a social animal. Here, Knight reacts. He agrees about the social. But we are social in a unique way—not by instinct and invariable reaction, but by our unique ability to adapt through learning, through handing on our learning and through knowing we so know. This creates a new gulf. *We* are faced with uncertainty, we can make errors, and we can choose to act wickedly; rocks and plants, tigers and termites cannot. If so, human sciences must differ radically from those about animals or natural forces.

From this it follows that, except hypothetically, the human sciences cannot consist of mere fact or theory, as in physics. For error and sin are excluded by pure logic. The heart of the matter for Knight is that the sciences themselves are social creations, built by human experience. And the differential of human behaviour is action from motives, not merely impulsion by forces. We *want* experiences; and unfortunately our wishes are not consistent, with one another's or with society's. If it were not so, as Knight dryly remarks, the problem would be much simpler. Because of these facts, some methods, open to the inanimate, do not apply to the human sciences. Especially, prediction is just not possible. For we can anticipate the motives of others, and of social " experiments," and so we can always

" beat the gun." As Knight is fond of saying, if both A and B predict each other's conduct, both will be wrong. For each will beat the other's gun. The sequel is important. For success between persons or between governments and persons among such conflicting motives, deceit and coercion are inevitable. Also, what is " right " will at least be matter of opinion, not an inevitability. Conflict will be positive, not just failure to understand.

From this, Knight's view of what he considers the dangers of " scientism " will be apparent. For it, " ends, motives, etc., are *data* merely; . . . Scientific knowledge alone is required for the prediction of social events; and the prediction and control of social events is all that is required for the solution of practical social problems " (p. 235). " A proper scientific education," which makes this known, will bring contentment with what is possible. In sum, all we need is an efficient Gallup poll. Especially, for economics, it is assumed that adequate knowledge will give the solution where many want the same things the means to create which are limited, a problem which includes " who is to bear the costs,and in what proportion." Knight is careful not to underestimate these views. He insists that the major part of our behaviour *is* induced just as the " scientist " position assumes. In view of science's present vogue, this gives force to its acceptance. Yet Knight also insists that this just misses the differential in human experience —choice with some rational basis. For it is just this element that makes human experience creative, and (possibly) progressive.

More positively, however, Knight's view of economics follows from his conception of the different types of knowledge derived from the different kind of force or agent which controls change in each field of knowledge. These fields he places in three tiers: knowledge of the external world; the truths of logic and mathematics; and knowledge of human conduct. To each field corresponds a different level of inducement to human action: force applies with us as in physical science; ends and means relationships can be taken in abstraction, as given. On such assumptions economics, for example, can become " a highly abstract ' concrete deductive ' science similar to . . . mathematical mechanics." In any human society, so treated (for instance economic statics), the assumptions rule out uncertainty and error. On the third level, however, any science of human behaviour must include all these (and evil also). At this level the motive to behaviour springs from what individuals-in-society *value*. But about our values there is no final agreement. Here, we are reduced to history, and guess-work. " Evolutionary " or historical economics is our utmost aspiration. At this level economics would aim not merely at logic but at understanding.

The " ends–means " assumption may seem here to receive scant justice. However, as Knight constantly says, ends-and-means is an infinite regression. Each end can in turn be a means to a higher end, relative to our efforts to improve our situation. Hence, it is reasonable to take any arbitrary " ends " (*e.g.*, economy) as given, and use them as the assumptions of abstract

sciences deducing the best " means." When we come to *values*, this arbitrary element in " means and ends " falls away, for value experiences have some *intrinsic* worth. They also have objective compelling power, simply because they are held in respect by individuals-in-society. They are in some sense "right," right for everyone, right as sanctioned in law and in moral and religious codes, which have rational compelling power. It is, then, at this level that what individuals want clashes with what is right or valuable. Here, " utility " does not reduce to any definable common denominator. What suffices for hypothetical science fails us when applied finally to specific human behaviour.

The conclusion is an all-out trust, with all the diffidence in the world, in the one weapon we have which offers any hope at all—the slow working of the free, impartial human reason. Negatively, this for Knight involves a deep distrust of all human principalities, of all merely emotional powers, so far as they operate to restrict reason's free play. Among such powers he at present rates high the dogmatism of mere science; partly because of its vogue to-day, but mainly because it commits the solecism of precisely missing the unique *human* problem—the problem of error and our choice of evil, and the concomitant blasphemy of putting mere authority—specifically authoritarian science—in its place.

> " Co-operation [for truth] in its ideal form is equalitarian or democratic in the ideal sense of that concept; it excludes any exercise of power or wish to exercise power over other participants in the quest, on the part of any individual. The pursuit of truth or of value in any form is the ideal type of ethical association, which is to say of all true society " (p. 132).

In this difficult pursuit Knight continually advises us " not to go too fast, not to over-simplify, not to grasp at easy solutions for hard problems." Here he thinks " the greatest danger is . . . a moralistic approach, attributing social evil to sin, with the implication of cure by liquidating someone. . . . People are not bad in the main, but they are ignorant, and do not understand." This reflects the eternal rationalist, though " in the main," plus ignorance, leaves room for an awful lot of sin. And it is not so much sin in the sense of evil willing that Knight is here denying as the convenient definition of sins by those in power, with their consequent measures to "liquidate" them. Those who still believe in sin (especially north of the border) could accept this.

The last two papers—including the champagne from this cellar, his presidential address to the American Economic Association—deal especially with liberty. Freedom he regards as the precious gift of the Enlightenment. "The establishment of freedom, rooted in the liberation of the mind from traditional dogma and mythology, enforced by ecclesiastical and political authority, is the greatest revolution of all time or since the dawn of conscious

life." Yet the advance has turned to retreat. "The liberal movement went wrong, partly because of the failure to think out its problems. . . , but especially because it generated expectations and implied promises impossible of fulfilment." More bluntly, it asserted rights which could be exercised only if the concomitant obligations were undertaken. The results of selfishness create the need for force to maintain essential order. But force in turn organises itself in self-seeking ways. And this is fatal for liberal society, because force permits of no argument, no discussion. But for Knight the highest level of discussion (and so government) is that which debates the higher human values. "Objective norms belong to a third level of reality, distinct from and above individual desire or end and means, as the category of the instrumental is different from and 'above' mechanical sequence or cause and effect" (p. 266). For Knight, such discussion hinges especially at present on the conflicting claims of freedom and justice (pp. 269–74). This is beyond our scope. I quote his main conclusions. "The first test of a free society is that it teaches its youth to question and criticise and form opinions only by weighing evidence . . . instead of implanting eternal and immutable truth, with abject submission to the inevitable by some prescriptive right" (p. 274). "The balance will always be hard to strike, and entirely a matter of judgment, not of formula, a balance between principles that conflict, while each claims to be absolute" (p. 277). "The object of devotion and pursuit is not ends but ideals, progressively redefined as they are progressively realised" (p. 278). And in the end "the prime necessity is simply the critical intelligence."

For this supreme rationalist, then, truth ascends in tiers from the abstract to the more concrete. On such a view all truths are relative. Only the truth is for us absolute. As "problem-solving animals," we pursue it endlessly. Frank Knight's many British friends rejoice in his continued zest. They will wish to add their tribute to this fitting birthday present. Many happy returns!

A. L. MACFIE

The University of Glasgow.

The Measurement of Utility. By TAPAS MAJUMDAR. (London: Macmillan, 1958. Pp. xiv + 149. 13*s.* 6*d.*)

THE theory of consumer's choice is a subject which lends itself readily to intellectual refinement, and in consequence has attracted to itself some of the most agile minds among theoreticians. Since empirical checks are slight, controversy flows freely notwithstanding the general belief, voiced by Professor Robbins in his foreword to this book, that the direction of its current is unlikely to have the slightest impact on business decisions or economic policy.

The sanguine expectations awakened by Jevonian utility, by Marshall's consumer's surplus, even by the more modest aspirations of Pigou's welfare economics, are now largely a matter of history. The reaction against the influence of Marshall, Pigou and other members of the Cambridge School gathered force and found expression in the thirties, notably in the work of Professor Robbins, who attacked all propositions building on interpersonal utility comparisons, and later, in the famous paper by Hicks and Allen demonstrating the sufficiency of ordinal measurement as a foundation for the theory of consumer's choice and, in effect, relegating cardinal utility to the role of a metaphysical poor relation. There were the diehards, of course, but for at least a decade following this development, the ordinal school was well in the ascendant, and if one spoke of marginal utility still, it was rather with an air of conscious catholicity emanating from a cultivated deference to tradition.

With the appearance of Von Neumann and Morgenstern's *Theory of Games* in 1943, this attitude began to change. A utility thermometer had apparently been invented, and the method used in its construction had prompted others to think up hypotheses claiming to shed light on behaviour in risk situations. Nor was the indifference curve analysis left unmolested and in possession of the field of riskless choices. Parallel with the rehabilitation of cardinal utility, a theory of revealed preference, associated strongly with the name of Professor Samuelson, began to gain ground. It boasted a more exacting methodology and its disdain of the indifference curve, as a sort of unnecessary crutch, was perhaps reminiscent of the way in which cardinal utility was, earlier, brushed aside by the ordinalists. And though a couple of years ago Professor Hicks sought to meet this new attack, in part by revising his previous hypothesis, the present position is still something of an interregnum, with no hypothesis widely held to the exclusion of the others.

Inasmuch as the literature on consumer's choice is extensive and often specialised, a short and popular survey with the aims of disentangling the chief issues and of appraising the contending claims with skill and detachment would indeed be a boon to the general reader. If Dr. Majumdar has not entirely succeeded in providing us with all we could legitimately hope for, he has made a worthy attempt. Certainly the author's controversial, though generally lucid, style makes for lively reading. And if his answers do not always satisfy us, we can agree that he has raised some important issues and provided a framework about which discussion might profitably be organised.

Following a short dissertation on the meaning of welfare in Part I, of somewhat uneven interest and relevance, Dr. Majumdar prepares the logical groundwork for Part II, where we are furnished with a suggestive frame on which to append the various utility hypotheses to be scrutinised: introspective cardinalist, introspective ordinalist, behaviourist ordinalist and

behaviourist cardinalist. It is not to be imagined that the hypotheses corresponding to these categories—respectively, those of Marshall (and, more recently, of Armstrong), of Hicks, of Samuelson, and of Von Neumann and Morgenstern (and Friedman and Savage)—are all alternatives. For riskless choices, the first three may be regarded as rival theories. But the fourth is quite consistent with the indifference–preference analysis: it could invest the indifference surfaces, for instance, with a set of values determined up to a linear transform.

Though a sharp methodological hatchet is at all times in evidence, and though the author wields it to some advantage within territory already made familiar to us by Marshall and Hicks, one has the feeling that in the newer terrain he is occasionally felling the wrong tree. For instance, while at all times grudging in his appraisal of the Von Neumann–Morgenstern "hypothesis," the weight of his attack is to be found in statements about the difficulty of estimating risks, the unlikelihood of their being known to the individual, and the irrelevance in any case of such information to the individual unless he is expected to make the same choice a sufficiently large number of times. Now any objection to this method of discovering the shape of a particular individual's utility function with respect to income, in an experiment which attaches probabilities to the alternative prizes, would be at least as pertinent to any endeavour to infer by experimentation the contours of some individual's indifference map. On the other hand, if Dr. Majumdar's remarks are to be interpreted as an objection to the hypothesis put forward in the Friedman–Savage paper of 1948, such remarks were anticipated by the authors at that time and shown to be quite beside the point. Indeed, on Dr. Majumdar's declared methodological maxim of testing the implications of a hypothesis, this sort of protest is inadmissible. If it were, Dr. Majumdar's favourite hypothesis, the indifference–preference hypothesis, would fare very badly. It does not seem to me that Friedman and Savage were exaggerating when they spoke of the richer empiric content of their hypothesis. If Dr. Majumdar wishes to make a dent in their theory, it is to this empiric content that he must address himself, as others have already done.

His case against Samuelson has a surface plausibility, but is hardly conclusive. No use is made of a substitution effect in Samuelson's revealed preference theorem, but, argues Dr. Majumdar, a substitution effect may be inferred if we happened to observe a price elasticity greater than unity in a situation in which all goods had a positive income elasticity. The distinction between the two effects, clearly defined in the Hicksian analysis, has value for Dr. Majumdar owing to the possibility of formulating demand theorems, first, when the income elasticity of demand is zero or negative but the income effect is smaller than the substitution effect, and second, when the income elasticity is negative and larger than the substitution effect. But surely the possibility that the demand curve can either slope upward or

downward when the income effect is negative adds nothing to the limited prediction of the hypothesis. True, if we could measure these two effects separately and in advance of a price movement there would be no need for a theory of demand: the need would be only for skilled econometricians whose job it would be to add these two effects, algebraically, for any anticipated price change and announce the result. But if they are not measurable in advance, it were better, surely, if we could depend upon the downward-sloping demand curve. And if not in all circumstances, at least under the simple condition ascertainable in advance, that the income effect is not negative. Whenever this simple condition is not met—when we observe in advance that the income effect is negative—we can but wait to see how the wind blows. The direction being observed, we must keep a straight face and calmly inform the interested public that the substitution effect must have been in fact quite a bit stronger, or weaker as the case may be, than the income effect. This is all that Dr. Majumdar's additional " theorems " boil down to.

Furthermore, his statement that there is no behaviourist theorem equivalent to the negative price–quantity relationship yielded by the indifference–preference hypothesis when the good in question has a zero income elasticity cannot be allowed. The most that might be made of this is the argument that, owing to its strong ordering, we derive a " weaker " theorem from the revealed preference hypothesis: if the price of X falls, X having a zero income elasticity, its quantity does not diminish.

Beyond these specific strictures, Dr. Majumdar's treatment seems vulnerable to a rather fundamental criticism; that of not carrying the scientific method far enough. For the best we can hope for from either of the rival hypotheses is, under certain restrictions, a downward-sloping demand curve for the individual. But, in economics, individual behaviour interests us only in so far as it is an index of market behaviour. Downward-sloping individual demand curves lose significance if, with their aid, we cannot infer a downward slope for the market demand curve. And, in fact, we cannot without violating the *ceteris paribus* clause; for one thing, a fall in the market price of the good under consideration, in principle, alters the distribution of income, leaving uncertain the resultant quantity taken by the market. Of course, we may choose to believe that if each individual has a downward-sloping curve, the chances of the market curve sloping upward over any range are remote. But even if we are right are we not guilty of a premature infusion of empiricism to jolt the theory along? After all, it is not the theory which tells us this; rather, it is we who tell the theory.

If, then, we cling on to any of these hypotheses, in disregard of our announced methodological purism, it is surely because the techniques associated with them have come to permeate our way of thinking. Despite appeals to Occam's razor, the indifference–preference hypothesis, for example, might well be preferred to the Marshallian, or revealed-preference, hypothesis

simply because it organises our thoughts so as to enable us quickly to grasp essential distinctions. In a society subject to transient fashion and spasmodic development the conditions necessary for close predictions may not exist, and the economist therefore, in examining any practical problem or policy, must have recourse to some degree of taxonomy. A technique which provides the right kind of insights at least helps the practising economist to make the right kind of conditional statement. We could do with more of such techniques.

There are, finally, some minor points which might be attended to in a future edition. The author's view of Professor Hicks as a stalwart of the hypothetico-deductive school will raise many an eyebrow. Other than the passage—in itself not unambiguous—quoted from the *Revision*, there is little in Professor Hicks' writings which can be cited in favour of this notion. Indeed, the remarks in Chapter 3 of the *Revision* on the range of alternatives facing the consumer, on continuity, and on the concept of indifference, manifest only a concern with the intuitive plausibility of these things. No less perplexing is it to find the "as if" Friedman of *Positive Economics* paraded before us as an "operationalist," notwithstanding his permanent-income hypothesis in his recent *Theory of the Consumption Function.*

In his chapter on the introspective ordinalist Dr. Majumdar states that the convexity of the indifference curve is equivalent to assuming diminishing marginal utility. Hardly! For the convexity of these curves is quite consistent with diminishing, constant or increasing marginal utility. Rather it might be said, then, that the chief ingredient of the negative sloping demand curve, from being diminishing marginal utility in Marshall has become, in the Hicksian system, diminishing marginal substitutibility.

The merits of the book stand up in spite of these and possibly other criticisms, which are perhaps unavoidable in the serious review of any absorbing and thought-provoking book. The exposition is non-mathematical and the book of a size that it may be read without undue effort in a couple of days. Provided it is read in the critical spirit in which it is written, time could hardly be put to better use.

E. J. MISHAN

London School of Economics.

The Control of Inflation. An Inaugural Lecture. By J. E. MEADE. (London: Cambridge University Press, 1958. Pp. 52. 5*s*.)

THIS pamphlet gives the text of Professor Meade's inaugural lecture as Professor of Political Economy in the University of Cambridge. It deals with the control of inflation, but it aims in both directions. The target was changing in the very weeks when the lecture was being prepared. Professor Meade was aware of this. "A more serious American recession than any-

thing which we have experienced since the end of the Second World War is always a possibility." He claims that one of the main virtues of his proposals for the control of inflation is that they are equally well designed to stimulate expenditure and to keep selling prices up in a period of deflationary pressure as they are to prevent price rises in an inflationary situation. And he adds, significantly and self-revealingly, " it is even more important to be in a position to offset any future deflation than to stop the present inflation."

What are those proposals? Professor Meade elaborates a ten-point scheme, of which the basic and very precise item is that the Government "should accept a precise commitment to keep a precisely defined price index below a precisely defined ceiling." The index should be composed of home-produced goods and services and insulated from all import content of these goods and services (a challenge to the statistician—what proportion of the price of a haircut is attributable to the hair-dresser's intake of imported food?).

The stabilisation of the index would be entrusted to a Stabilisation Commission, subject to the ultimate control of the Chancellor of the Exchequer. Its measures of control should include variations of a levy on personal incomes such as the National Insurance contribution. Professor Meade's proposals would involve a break with free wage negotiations. He suggests that a body like the Council on Prices, Productivity and Incomes should publish estimates of the rise in earnings that would be compatible with stable prices, and it would be left to arbitral bodies to decide whether workers in particular industries should obtain wage increases above or below the average. There should be public scrutiny and control of restrictive practices in the labour market. Finally, Professor Meade does not disappoint his faithful followers by failing to bring up the variable rate of exchange. If, he says, financial policies are concentrated on domestic stability, variations in exchange rates should be made much more freely as a means of preserving equilibrium in the balance of payments.

There is in Professor Meade's argument the unwavering logic that we have come to expect from him—but a logic so inexorable as to verge at times on the unrealistic. Economic policy is the art of the possible. The trade unions could, admittedly, abandon the principle of free wage negotiations. Many people believe that they should. But to assume that they will is to fly in the face of all the evidence that has accumulated on this subject.

Professor Meade's proposals should, however, be criticised on other than these grounds of practicability. The main weight of his balancing measures would be applied to consumer purchasing power. How does this fit into the pattern of the world recession of 1957/58 which has offered the paradox of a decline in economic activity and a growth of unemployment coinciding with a continued rise in national price levels at the very time when there has been a substantial fall in primary commodity prices? In accordance with the Meade formula, the holding of the index below the precise ceiling would

have called for an increase in taxation or in National Insurance contributions.

Does Professor Meade believe that, even though the British and the United States indices of retail prices have risen over the past year, each of these countries should have raised taxation or otherwise encroached on the purchasing power in the hands of its consumers? Since the indices would have risen even more had they been insulated from the impact of lower import prices, the required deflationary dose would have had to be severe—a strange corrective to the industrial stagnation that has gripped these countries.

PAUL BAREAU

London.

La Fin de l'Inflation. By J. GABILLARD. Observations Economiques, No. 5. (Paris: Société d'Edition d'Enseignement Superieur, 1952. Pp. vii + 359.)

L'Inflation Française d'Après Guerre 1945–1949. By J. LE BOURVA. (Paris: Armand Colin for the Centre d'Etudes Economiques, 1953. Pp. 381.)

IN the study of inflation (as in that of the trade cycle) there are many mansions, and the two books under review are excellent examples of different lines of specialisation along which the analysis of this complex and heterogeneous phenomenon can be attacked. Dr. Le Bourva has made an intensive study of inflation in the French economy during a relatively short period; Dr. Gabillard attemps a comparative analysis of the forces and sequences by which inflation has been brought to an end in a number of economies.

A feature which they share is the combination of an attempt to apply modern theory to their data wherever possible with a determination to avoid over-generalisation; to look at the different markets and sectors of the economy separately. Thus, Dr. Le Bourva makes, or draws on, a number of statistical studies of the ways in which prices were fixed in the French economy. For agricultural products, which were mostly free of control from quite early in the period, there is a very close general relation with the wage-bill, while for particular products (especially meat and wine) the supply is shown to have had a powerful effect on price. The econometrics of these investigations may be somewhat over-simple in view of the shortness of the period in question and the predominance of simple trends through it—in fact, the causal mechanism of price-formation is largely assumed rather than proved—but a convincing general picture is presented.

In discussing the prices of manufactured goods, the author deduces, partly from a small but interesting sample inquiry made from Rennes, that entrepreneurs followed a policy, predominantly, of full-cost pricing. Wage-rates are shown to be explicable on the assumption that they follow the cost

of living with a short lag. These are the elements of what is now a familiar model of inflation in western countries, but the author must rank as one of the pioneers of it, and his assumptions are very carefully checked—though, as with most models, the equal plausibility of some rival system is not excluded.

Dr. Le Bourva develops his model more systematically than these brief remarks might indicate. The rise of import prices (including that due to the devaluations of the franc) is shown to have played a considerable, though apparently not a commanding, part; the functions of public finance and state-controlled investment are taken into account; the course of events in the economy as a whole is finally reconstructed from the main variables which have been mentioned and the simple regression relations between them. Monetary conditions have no place in this reconstruction; after a careful discussion of monetary policy, the author concludes that it was not carried so far in any direction as to prevent money from playing a passive part in the French inflation, the great decrease in liquidity during this period notwithstanding.

Dr. Gabillard's scepticism of broad generalisations leads him to the thesis that the end (and presumably much else in the course) of an inflation can be explained only by looking at a number of different forces in a number of different markets, which, of course, have repercussions upon one another. During inflation, the degree of dispersion of different prices, measured as percentages of the median price, is shown to be increased, so that heavy distortion of the price-structure takes place; the downturns of different prices are also shown to be widely separated in time. Such facts certainly discourage reliance upon simple, macro-economic explanations of the downturn in the price-level as a whole.

When it comes to identifying particular kinds of force, the author distinguished three broad classes; the relaxation of inflationary factors in inflationary markets, the appearance of deflationary factors and the appearance of rigidities which block the spread of inflation from its points of origin. It is not entirely clear that this classification assists greatly in the understanding of the events analysed, though it does, perhaps, serve to emphasise the variety of sources, within or without the economy, from which anti-inflationary (or, for that matter, inflationary) impulses may come.

The most valuable part of the book is, perhaps, the analysis of a number of conclusions of inflationary episodes—in the United States in 1920, in Germany in 1923, in France in 1926 and the United States in 1948. In the first of these instances, improvement of agricultural supplies, a weakening of labour's bargaining-power, monetary stringency and the overtaking of consumption by stock-accumulation are given the chief credit. For the German hyper-inflation the analysis is less convincing, except where, like other writers, the author emphasises the extreme sensitivity of the expectations entertained by holders of goods or of foreign exchange to events such as

the introduction of the Rentenmark. Indeed, hyper-inflation is the type of episode in which broad, macroeconomic explanations are at their strongest; the differences between markets and sectors of the economy sink into quantitative insignificance in comparison with the vast common movements of prices. For France in 1926, again, the author seems to be driven to stress the paramount importance of the single factor of confidence—the confidence, as he emphasises, of a restricted class of asset-holders to whom Poincaré was politically acceptable, as opposed to the broad mass of the community whose expectations (reflected in wage-settlements particularly) have been of importance in more recent inflations. The 1948 downturn in the United States again gives Dr. Gabillard scope for displaying a wide variety of forces of more nearly equal importance. The variety of inflationary episodes extends to their being sometimes very complex, sometimes very simple.

This brief and belated review may perhaps serve to indicate the admirably empirical spirit of these two useful French studies. That justice cannot be done to them in so short a space is a consequence of their virtues.

A. J. Brown

University of Leeds.

International Economic Papers, No. 7. Translations prepared for the International Economic Association. (London: Macmillan; New York: The Macmillan Company, 1957. Pp. 184. 15*s.*)

Since 1951, we have all looked forward with pleasure to the annual appearance of *International Economic Papers* with its miscellany of articles, some of which may be old chronologically, but all of which are new to the overwhelming majority of English-speaking economists. Who can tell, except those few whose suggestions, translations or editorial work go to build each volume, what particular mixture is to be brought forth in each succeeding year? Few would surely wish to know what was to come, for it is the lucky-dip quality of this publication which is responsible for its unique charm—if charm is a word suitable to describe an academic journal. The fascination of the unpredictable is not among the virtues of many of the otherwise virtuous regular journals. For these, if each new issue is not exactly predictable, one is scarcely surprised to find yet another article on subject X in journal A, to gain the impression from journal B that economists are highly skilled mathematicians and from journal C that they find simple algebra quite a handful, or to find long tables of figures prominent in most of the articles in journal D.

A high degree of auto-correlation among different issues of the same journal is not necessarily a vice, and may well be a virtue to impecunious academics making out their subscription lists. Nevertheless, as a liberalising exercise, nothing could be better than to read every article in each issue of *International Economic Papers* as it appears for, in that journal, no topics or

styles (save only the very mathematical, for which translation is less essential) are excluded.

The latest issued, Number 7, keeps up the tradition of variety. From the classical period we have two articles by Sismondi on effective demand, from the Swedish macroeconomic school two recent papers (by Lindahl and Kragh) on national accounting and budgeting, there are two contemporary Marxist papers by Lange and Brus concerned essentially with the problems of allocation, especially of consumer goods, in a Communist country, and three other articles, two pre-war, by Einaudi on tax capitalisation and Gibrat on economic inequalities, and a contemporary article by Giersch on welfare and international trade. Not only is there variety in subject, in time (Sismondi's first article was written in 1820, the most recent contribution is dated 1956) and in country of origin (five countries are represented), but, perhaps most noticeably, in style. We have the drawing-room polemics of Sismondi, the algebraic style of the Scandinavians, the uncomfortable style of the Marxists, the soothing modern welfare style (all essential points italicised) of Giersch.

All the articles are well worth reading, if none is a masterpiece. Perhaps the best is Lindahl's critical examination of national accounting concepts and methods—certainly a field not lacking in literature—although Giersch's vest pocket *Trade and Welfare* (written before Meade's book appeared) is very elegant. The two papers written in the inter-war period (those by Einaudi and Gibrat) remain quite contemporary, since they are contributions to two slow debates of which the end is not nearly in sight. To many readers, the two most interesting articles will be those by Lange and Brus, providing, as they do, a clear picture of the Marxist economist attempting to come to grips with the problems of allocation, especially allocation of consumer goods, without falling into " capitalist " terminology.

To contrast two articles, those by Giersch and Brus, throws a great deal of light on the respective methodological problems of economists west and east of the so-called iron curtain. Both writers are concerned with the same fundamental problems, those of welfare and allocation. Brus discusses many things with which we are familiar, but avoids the familiar names, while Giersch uses all the familiar names, but one wonders to what things these names refer. Here, for example, is a sentence from Giersch:

> " This equilibrium is optimal only if the social marginal cost of production of A in a and the social marginal cost of shipment (including all cost of transfer) from a to b are together exactly equal to the social marginal cost of B in b, which includes the social marginal cost of transport to b if the good is not produced in B itself."

Compare with this Brus attempting not to call a spade what we would call a spade:

> " . . . the transfer of means of production from the supplier to the recipient (both State undertakings) is a movement of goods which is

> strictly planned and purposeful . . . But although this is a sale in form only, it does not follow that the money check loses its importance. Payment in money should be an act of definite acknowledgement that the labour which has gone into the product is indeed *social labour*" (my italics).

If Brus is inhibited by being quite unable to speak of the holy "means of production" being bought and sold, or having a market, Giersch suffers from the prevalent Western disease of being carried along by the sweep of logical connection between a series of familiar names, even if these do not represent identifiable things.

Revealing juxtapositions like this are among the greatest benefits to be obtained from *International Economic Papers*, and it is to be hoped that the editors continue the tradition of variety, even if it sometimes involves selection on grounds other than quality alone.

KELVIN LANCASTER

London School of Economics.

Quality and Competition: an Essay in Economic Theory. By LAWRENCE ABBOTT. (New York: Columbia University Press (London: Oxford University Press), 1956. Pp. 229. 30*s*.)

IN this book Professor Abbott has made an intelligent and useful contribution to the theory of monopolistic competition. Taking as his starting-point the fact that product or quality competition has received far less attention in the literature than price competition, Professor Abbott has set out to develop a comprehensive analytical treatment of quality competition. The result is a stimulating work: less original and startling than Professor Abbott would have us believe, but nevertheless a brave attempt to tackle a difficult and elusive subject.

Professor Abbott begins by attacking the notion that pure or perfect competition in the sale of a standardised product should be regarded as the ideal competitive standard. He argues that product differentiation is not only an integral part of the modern world but also a desirable feature of it, because it yields benefits that would be lost if competing products were homogeneous. It cannot be assumed without further examination that product differentiation is a monopoly element and therefore undesirable. Indeed, one of Professor Abbott's main contentions is that competition is more active when there is quality as well as price competition. In his view, an analysis which concentrates on price competition among the producers of a given set of products leads to a seriously distorted picture of the economic world. What is needed is a truly general theory that explains not only the structure of outputs and prices but also the structure of goods and services.

Professor Abbott follows other writers in drawing a distinction between the ends of economic activity and the means to those ends. What people

really desire, he asserts, are not products but " satisfying experiences." The desire for such experiences he calls " basic wants." The desire for products which enable basic wants to be satisfied he calls " derived wants." Basic wants are largely determined by one's culture, and can be modified only slowly. Derived wants, on the other hand, are for products which are not wanted for their own sake but to satisfy basic wants, and they therefore indicate only a provisional choice. Old products may readily be displaced by new products if these are felt by consumers to satisfy their basic wants more adequately. Consumers try to obtain the optimum variety of any product, that is that which would, if produced, provide the maximum satisfaction of wants. When price is a consideration they try to obtain the " optimum bargain." Producers alter the quality of their products whenever they believe that new qualities will satisfy consumers' basic wants better than the old. Small innovations are therefore continually being sought, even in conservative industries. Professor Abbott regards innovational changes in consumers' goods not as occasional interruptions of the routine of maximising conduct but as an integral part of it. In his view, the dynamic elements in quality competition are of great importance, and he stresses the fact that one of the most striking characteristics of competitive markets is their evolutionary character. This type of quality competition, he argues, leads to an increase in the welfare of consumers because their individual wants are catered for more precisely than by homogeneous products. Professor Abbott refers at one point to the possibility that variety may involve an increase in costs so great that this more than offsets the higher satisfaction given by a variety of products, but this is only a passing comment.

Professor Abbott's next step is to consider some distinctions that he believes have been made possible by his analysis, and it is at this point that one feels most vividly that Professor Abbott is overrating the importance of his own contribution. He considers here, for example, the well-known problem of defining an industry under conditions of monopolistic competition. He attempts a definition in terms of wants—an industry, he suggests, " consists of all those products any one of which is capable of making a particular type of contribution towards the attainment of some experience or activity "; for example, safety razors and electric razors both make a particular type of contribution to a man's desire to be well groomed, and are therefore produced by the same industry. Professor Abbott claims that his definition is superior to one based on cross-elasticities of demand, but it is difficult to see how. It would appear to solve none of the problems associated with the cross-elasticity definition and to be a good deal less precise. Nor is much new illumination gained when Professor Abbott uses his definition of an industry to illustrate the distinction between an industry-wide monopoly and an individual firm's monopoly of a single variety of a product.

The rest of Professor Abbott's book is concerned in effect with the problem

of equilibrium under conditions of both price and quality competition. Although, as has been said, the author is very much aware of the dynamic nature of quality competition, he is forced to concentrate on equilibrium situations in order to make the analysis manageable. He first defines competition in terms of a contest between independent sellers, and then makes a useful distinction between quality competition that is horizontal (different types of product at much the same price), vertical (better quality at a higher price) and innovational. On the basis of a large number of assumptions, he develops an elegant geometrical analysis of quality competition, holding price constant, which enables him to investigate both horizontal and vertical equilibrium. Using what he calls a " cost of options " curve, he is able to determine the number of varieties that will be produced in an industry and to specify the level of quality of these varieties. The next step is to consider equilibrium when both price and quality can be varied. The equilibrium position here depends on the strength of consumer attachments to particular varieties and the steepness with which the average cost curve falls. Professor Abbott comments that " the difference between actual unit cost and minimum unit cost of the typical products of our economy is a measure of the price we pay for the diversity, richness and refinement of our advanced civilisation and our high material standard of living." Diversity and variety, however, cannot be afforded by an impoverished society. The proposition that " the minimum point on the average cost curve is the proper criterion of maximisation of welfare " is a generalisation " valid only for the economics of underdeveloped countries."

Although it is to be doubted whether many economists will think Professor Abbott's conclusions to be as revolutionary as he clearly believes them to be, much of what he has to say will be readily accepted by them. However, there are a number of provisos that need to be made. The first is that in his eagerness to tilt against " traditional " price theory, Professor Abbott has gone too far in the other direction, and his description of price theory is to some extent a caricature. What is more important, Professor Abbott dismisses far too easily the arguments of those who stress the monopoly elements in product differentiation. We are given no empirical justification for the view that quality differences and changes are not in general a monopolistic imperfection but a competitive element. Professor Abbott refers to possible imperfections in quality competition, such as ignorance and lack of decision on the part of consumers and deliberate attempts to deceive on the part of producers, and he admits that his arguments apply more to some types of market than to others, but he plays down the importance of factors such as these. He also says little about the influence of oligopolistic situations on the nature of quality competition. At one stage, when referring to yearly changes in automobile designs, Professor Abbott does suggest that these are perhaps " undesirably frequent," but this is a line of argument on which he does not elaborate, at least in so far as it relates to countries such as the United

States. One can accept his view that competitive changes of product are a very important dynamic element in western economies, but one cannot ignore the possibility that many such changes may lead to no increase in economic welfare and may even lead to a decrease. Professor Abbott has, in short, gone too far and claimed too much. There is, however, a great deal of hard thought in his book, and it will repay reading and thinking about even by those who will want to take its conclusions with a grain of salt.

AUBREY SILBERSTON

St. John's College,
Cambridge.

Common Sense about the Common Market. Germany and Britain in post-war Europe. By E. STRAUSS. (London: Allen & Unwin, 1958. Pp. 169. 15*s*.)

THE Common Market, inaugurated in March 1957 by the Treaty of Rome, is seen by Mr. Strauss as the latest manifestation of an idea which had been alive in Europe for over a hundred years before the Second World War: first as the Zollverein of 1834, then as Friedrich Naumann's *Mitteleuropa* (1915), and finally as the *Anschluss* of the 1930s. "The idea of a common market initiated by a customs union thus played a significant part on three occasions during the last century. In every case it was advocated by the liberal elements amongst Germany's business classes . . . ," mainly because it would facilitate German industrial expansion.

For the same reason German business interests more recently accepted the European Coal and Steel Community, which was in so many ways the forerunner of the Common Market. "So far from keeping the growth of German heavy industry under control and preventing the re-establishment of its old preponderance, the Community has proved a first-rate framework for Germany's industrial re-expansion" (p. 68). Then, in the subsequent negotiation of the Treaty of Rome, "the basic fact is Germany's success in securing the acceptance of the common market scheme on terms which ensure Germany's eventual predominance in Western Europe" (p. 91).

What are these terms? They amount to a brand of *laissez faire* which "may be expected to make Western Europe safe for capitalism," including (very probably) monopolistic capitalism (p. 98). "Throughout the treaty the workers are only considered, if at all, as the poor relations of the dominant economic interests" (p. 101); moreover, little attempt is made to safeguard the interests of backward areas such as southern Italy (p. 112) or to facilitate measures to combat any future general economic depression (p. 113).

Admittedly, in the course of negotiations substantial concessions had to be made on points of secondary importance in order to secure compromise solutions acceptable to all members, and particularly to France, and examples of such compromises are to be found "in such matters as the community tariff, as far as it has been finally settled, the functions of the European

Investment Bank and the European Social Fund, the association of overseas territories with the community and the regulation of agriculture" (p. 136). Most of these compromises are viewed with distaste by leading German spokesmen, but "the German negotiators did not cry for the moon and were willing to pay for the very valuable concessions to German interests which the treaty contains" (p. 137).

How should the British Government react to the establishment of the Common Market? Mr. Strauss thinks that we should try to do a deal with the Six roughly on the lines of France's deal with her five fellow members: we should try to achieve for the rest of the Commonwealth the privileged status enjoyed by France's overseas territories.

> "Such a policy would bring obvious gains to the participating Commonwealth countries in the shape of partially protected markets throughout the Community: the corresponding drawbacks would not be suffered by these countries but by the United Kingdom whose preferences in the Commonwealth markets concerned would be reduced in favour of the other members of the scheme" (p. 144).

But unless we are prepared to make sacrifices such as this we cannot expect to interest the Six in a wider area of freer trade.

Hitherto the British Government has failed to realise that it must needs make concessions if it is to conclude a deal with the Six (p. 137). Moreover, it has been remiss in favouring, instead of challenging, the extreme *laissez faire* philosophy which pervades the Common Market agreement (p. 138). Only if we profess an interest in economic planning and in particular for continued protection for backward areas (p. 145) can we hope to find supporters (either inside or outside the present Common Market) for any scheme for a wider area of freer trade.

The implications of the Treaty of Rome, a highly complex and on many points very obscure document, are anything but easy to assess, and I expect I shall not be alone among Mr. Strauss' readers in my unwillingness to swallow outright the whole of his interpretation. I would, for instance, have been grateful for a better presentation of his case that a Free Trade Area is incompatible with a full-employment policy on a national scale (p. 141), that the gospel of Cobden and Bright is irrelevant or dangerous in the case of agriculture (p. 146) and that "free trade is incompatible with the interests of the more backward countries" (p. 145). But a great deal of what Mr. Strauss has to say is very persuasive indeed, and in addition there will be few readers who are so expert in this field that they will not profit from Mr. Strauss' remarkably lucid guide to a formidable complex of tortuous negotiations and indigestible documents.

BRIAN TEW

University of Nottingham.

Productivity and Economic Incentives. By J. P. DAVISON, P. SARGANT FLORENCE, BARBARA GRAY and N. S. ROSS. (London: Allen & Unwin, 1958. Pp. 306. 35*s*.)

THIS book examines the effect of economic (mainly monetary) incentives, with particular reference to productivity and earnings. The difficulty, of course, of estimating the effect of any change in working conditions is, first, that of isolating the change. This is particularly so in the case of incentive payments, which are often introduced as part of a comprehensive reorganisation of equipment, methods and working conditions. The second difficulty is that of finding adequate and comparable records relating to the periods before and after the change.

As a first line the authors were able to investigate fifteen different operations in five factories where output and earnings had been recorded before and after the introduction of incentive payments and where there had been no other major changes. The total number of workers involved was 130, of whom, in order to assess the impact of incentives on the workers, 118 were interviewed. The usual change was from time-rate to a straight piece-work bonus payable on output in excess of standard. Increase in output per man-hour varied from 7½ to 291%, about half the cases showing increases between 43 and 76%. Increase in earnings per man-hour varied from 12 to 49%, about half being between 18 and 38%. The account of the interviewing procedure adopted and of the evaluation of its results is complicated, particularly the attempt to arrive at percentages of satisfaction. It is, however, reassuring to learn that there was found to be a significant positive relationship between satisfaction with incentive schemes and increase in earnings.

The scope of these particular investigations, covering only some 130 workers, was admittedly narrow, but the results are in line with other less-detailed inquiries conducted by the authors covering factories, laundries and retail distribution. There is also an interesting discussion of the possibility of extending incentive payments into fields hitherto regarded as unsuitable, such as services and house and factory maintenance. Instances are given of substantial increases in output and savings in labour cost achieved in such fields.

In many of the cases examined in this book the increased output obtained, the less than proportionate increase in earnings and the consequent reduction in labour costs per unit of output are clearly the result of the setting of standard outputs, on the basis of work study, considerably higher than the outputs previously being obtained on time-wages. In other words, to obtain the same earnings as previously the workers would have had to work harder; to obtain the higher earnings which they did in fact achieve they had to work considerably harder. There appears to have been some evidence, particularly at the level of trade-union officialdom, of dissatisfaction with a system under which earnings increased less than output and a feeling that, on the

contrary, in view of savings on overheads, there would have been a case for earnings increasing more than proportionately to output. On the other hand, it is stated that the workers themselves were prepared to accept an increase in earnings less than proportionate to the required increase in output when both were " believed to be fair." It would therefore seem to follow that workers' acceptance must have been based on a realisation that their previous output was " unfair."

This brings us back to the fundamental question of whether there are not other, simpler and possibly even more effective means than incentive methods of payments of inducing such an attitude of mind among workers. There is a short discussion in the book of the alternative of the high time-wage system, more common in the United States than here, but sometimes used here also (as, for example, in the construction of the Fawley refinery) by companies with American associations. Such a system, however, it is pointed out, usually involves setting output standards, detailed recording of output, strict supervision and the threat of dismissal for failure to achieve the standard. This, too, would therefore appear to be a system of incentive payment with the penalty of loss of employment and its accompanying high wage as a means of achieving standards of output. Whatever may be the advantages of a high degree of supervision, there is evidence, in the interviews recorded in this book, of worker satisfaction when, under incentive payments, they feel they are no longer being physically driven by supervisors and the latter can devote themselves to other aspects of efficient management, such as supply of work and reduction of delays.

A further point brought out in the book is the considerable transfer of trade-union power from the centre to the workshop which is involved in the successful application of incentive payments. A complete chapter is devoted to a case study of the negotiations at a factory over a period of years for the introduction and application of an incentive payment system. The sympathy and cordiality existing between the management and the higher levels of the trade union proved no remedy for suspicion and hostility in the factory itself.

H. S. KIRKALDY

Queens' College,
Cambridge.

Human Relations and Modern Management. Edited by E. M. HUGH-JONES. (Amsterdam: North-Holland Publishing Company, 1958. Pp. x + 256. 20 guilders.)

THE editor explains the plan of this book as being that of exploring human relations and their implications for management in three situations—among workers on the shop floor, when labour is organised and at the highest level of management itself. He states that, no attempt having been made to impose

any particular point of view on the various authors, it may well be that the careful reader will find some overlaps and repetitions. An even greater difficulty, however, lies in finding the unifying link, other than the tenuous one implied in the title, between the very varied contributions which make up this volume.

Chapter 1, by Professor Meij of the State University of Groningen, outlines a theory of management based on the span-of-control concept. Chapter 2, by Dr. W. H. Scott of the University of Liverpool, deals with the various elements in the factory structure and suggests that the main need to-day is for a further development of the role of union representatives at plant level and a division of authority between national and local officials on the lines prevalent in American trade unions. Chapter 3, by Professor Kahn of the University of Michigan, criticises the non-psychological approach of classical scientific management and describes a series of studies conducted by his University which concentrated on the ability of business and industrial organisations to achieve their formal goals and also to offer high psychological return to their members. Chapter 4, by Professor Young, of the University of Wisconsin, gives a concise history of the development of organisation among workers and employers and of collective bargaining in the United States and criticises the attitude of managements which regard human-relations programmes as a substitute for collective bargaining.

Chapter 5, by Dr. N. S. Ross of the University of Birmingham, dealing with organised labour and management in the United Kingdom, is perhaps the most interesting of the book. His main theme is a condemnation of the common tendency for management theorists to regard the firm as an isolated unit and as a self-contained and self-sufficient social system, and to regard the function of management as being to weld a mass of individuals into a single viable organisation and to unify, integrate or liquidate sectional groups and special interests. Rather, he suggests, the firm should be recognised as a plural society and the function of management should be regarded as that of controlling and balancing the activities of constituent groups. He frankly recognises the difficulties of government of such a plural society, but suggests there are other and greater dangers to human relations and managerial efficiency in policies based on an authoritarian concept of organic unity of the firm.

Chapter 6, by Mr. E. F. L. Brech, senior partner of a British firm of management consultants, deals with the responsibility which should be assumed by boards of directors for company policy in regard to human relations and with the inhibiting effects on management of disharmony and inefficiency within the board room itself. His suggested Schedule of Responsibilities of boards of directors is a clear statement of what the uninitiated might imagine boards of directors are already doing or attempting to do. If they are not, it is questionable whether setting the points out in print would provide any guarantee of their observance in practice, particularly in boards

where personal relations exist such as those depicted by Mr. Brech from his own observations. Chapter 7, by Professor Revans of the University of Manchester, based largely, but not entirely, on his own well-known research into the coal-mining industry, deals with the problems of management associated with the size of undertakings. He emphasises the need for further study of organisation and for clearer definition of abstractions which figure so commonly in management literature. The conclusion, he suggests, may be as simple as this: when managers and supervisors are either overloaded or caught up in a snare of functional complexity, they will not know the men's troubles, and morale will suffer most readily in the biggest unit. Chapter 8, by Professor Wight Bakke of Yale, propounds the view that the first and most important function of management is to think. He suggests, too, that, whatever management may think it is doing, it cannot be the sole planner; every single participant in the flow of productive work in fact participates in the planning. The decisions are not in fact made by management; management can only propose, and the decisions are made by everyone whose activity and work are involved in carrying out the proposals.

It will be seen that there is variety in this book. The approach varies from theory to factual description and the conclusions from practical programmes of action to somewhat platitudinous exhortations. The clearest lesson which, taking the contributions as a whole, one could draw is that which in fact is the main theme put forward by Dr. Ross—the tendency in the theoretical treatment of management blandly to ignore the institutional structure of workers in industry or impatiently to try to brush it aside as an irrelevancy.

H. S. KIRKALDY

Queens' College,
Cambridge.

Technical Education and Social Change. By STEPHEN F. COTGROVE. (London: Allen & Unwin, 1958. Pp. 220. 25*s.*)

Internationale Tendenzen in der Entwicklung der Ausgaben für Schulen und Hochschulen. By FRIEDRICH EDDING. (Kiel: Institut für Weltwirtschaft, 1958. Pp. 164 + 166. DM 20.)

THE relationship between expenditure on education, social change and economic growth is only beginning to be explored, and these two books are important landmarks. Dr. Cotgrove has taken as his subject the changing social and industrial pattern as it is mirrored in the education system. After a somewhat thin start in the nineteenth century, when for social reasons technical education was second-class and second-rate, he develops an argument that the relative stagnation in British industry led to an undervaluing of the skilled and educated man, and that this was connected with the constant proportion of arts and science graduates from universities and the slow rate of expansion of higher education. The social system led to a

division between graduates and non-graduates, for whom on the whole technical education was designed, and this pattern ceased to have meaning when the forces of expansion and change seized the economy in the Second World War. In the modern economy there is seen to be a conflict of aims and intentions in education, arising from the rigidities of an outmoded class structure which tries to constrain the forces of growth. This occurs at all points of the education system—the grammar schools have a social role which conflicts with the educational needs of a changing society; the universities try to maintain the gap between them and the technical and teacher-training colleges—one could continue the catalogue indefinitely.

In technical education Dr. Cotgrove throws remarkable light on the distortions produced by the demand of the students at technical colleges for degree courses (one-quarter of the nation's science graduates come from technical colleges); the determination of the universities to keep the colleges down; the pressure of professions on the colleges and on their students (accountants are almost forced to take correspondence courses); the retention of local-authority control, although it means that academic growth is prevented; and, above all, a complete misunderstanding until recently of where Britain's lack of education really hurts most. The nation is not so much short of an *élite* as of a mass of educated scientists, technologists and business-men, and the universities have been so obsessed with maintaining "standards" that the appearance on the international scene of nations which could have both an *élite and* a mass of educated persons was at first not noticed. As Dr. Cotgrove says, until recently there was no pressure-group for change; this book is one in itself.

So, too, is Dr. Edding's book. He has taken a number of countries (over twenty in some cases, but Germany, the United Kingdom, the United States, the U.S.S.R. and Japan in detail) and discussed the relation of education expenditure to economic growth. He finds that there is a close correlation between economic growth and rising education expenditure as a proportion of the national income; this assertion conflicts with the results of other studies, and may spring from an improvement in statistics as national incomes increase, as he himself admits. The richer a country is, however, the more education expenditure is likely to begin to fall off, and this is certainly true; the U.S.S.R., spending possibly nearly 8% of its national income, and Japan, with 6% are exceptions to this rule—the explanation lies in attempts to pull themselves up by their own boot-straps.

As education expands, so the length of time pupils stay at school grows and the size of their classes fall. In the United States average school and college life is well over thirteen years; in the U.S.S.R. the pupil–teacher ratio is 17 : 1 (about half the British). In the U.S.S.R. teachers are paid very well, and the quality of education is high; in the United States the contrary is the case, but in neither country is there any serious opposition to the idea of as much education investment being made in each pupil as he is

prepared to stomach. These two countries have passed a barrier which other countries, still wedded to an *élite* education, are approaching. Dr. Edding finds that despite differences over the form and content of educational provision, in general the economic problems are the same in all countries. Growth is closely dependent upon education, and the tendency is always towards more education being given to more people, rather than towards an unlimited expenditure on a very few.

His work points the way to rich rewards in international comparisons of these economic matters, and is a triumph over the limitations of national-income and education statistics. With some more heroic efforts the rewards will be attained. Even the Ministry of Education might see its way to more than one table in its annual report on the expenditure of the hundreds of millions it supervises.

JOHN VAIZEY

Oxford.

Managers, A Study of their Careers in Industry. By R. V. CLEMENTS. (London: Allen & Unwin, 1958. Pp. 200. 20*s.*)

THIS book is a useful and stimulating addition to the growing literature about industrial managers. It is based on interviews with 646 managers in twenty-eight firms in Lancashire and north-eastern Cheshire. The firms range in size from thirty-two employees to between 3,000 and 10,000. Most were either textile manufacturers or engineers, but about a dozen other types of light industry were represented. The men to be studied in each firm were determined by " rule of thumb methods in consultation with each firm." They usually include working directors, sales managers, works managers, the head draughtsman or designer, the chief engineer, the secretary, the accountant and the chief of research. The study is limited neither to directors, as was G. H. Copeman's, nor to very large firms, as was that by the Acton Society Trust.

Mr. Clements has exploited his statistical data very fully to present pictures of these managers according to their career patterns, social origins, mobility, type of departmental work, chances of reaching top management, as well as to assess historical trends in appointments since the 1920s. Of particular interest is his description of the attitudes of the men he interviewed, why they entered industry, their reasons for changing firms or remaining where they were, their assessments of their own training and experience, and their views of top management.

After warning the reader of the dangers of generalising from his data, the author presents his conclusions in a clear, concise, balanced and thoroughly readable manner—something which can be said of few studies of this type. This readability is achieved in part by discarding some of the usual scholarly apparatus. There is no bibliography, and footnote citations are almost all

cross-references. Non-academic readers are likely to be attracted by the absence of statistical tables in the text. They can skip the figures if they want and accept Mr. Clements' deductions from his careful study of them. Some of the supporting statistics are to be found in the Appendices, and the author is willing to supply others on request. Most of these figures are given in absolute numbers; the interested reader or fellow-researcher is invited to use the raw data to make his own calculations. Certain difficulties arise, the most serious being the failure to make any tests of significance. Because of this the author is led to report on one page that " rather fewer science than arts graduates or accountants are in top management or become directors " (p. 147), while a few pages later he gives rather a different impression of the same figures in stating that the " chances of science graduate managers becoming top managers appear to have been nearly but not quite equal to those of arts graduates " (p. 150).

The main conclusions are less equivocal, though the reader is occasionally left in doubt as to which are based on evidence and which on opinion. Mr. Clements finds that the types of manager who are gaining in importance are the specialist trained before he entered industry and the man with a secondary education who enters industry at the bottom, in manual or clerical work. He finds no reason to think that family recruits will decline in importance or that the number of arts graduates taken as management trainees will expand. Supply, he thinks, will be the limiting factor in both instances. The groups likely to lose ground are those designated as special entrants, men without qualifications who have started their careers in industry with certain social advantages, and the largest group in the sample, those who began in manual work after an elementary school education.

These possible trends reflect very largely changes in the educational world before 1944. But Mr. Clements does not think the 1944 Act will bring a change in the social origins of managers. Sons of working-class parents who attain management positions are tending to be better educated than formerly but not to increase their representation. Industry is leaving the selection of ability to the schools, where the writer feels the greatest wastage of potential talent takes place in the secondary modern school. Industry itself is making no contribution of its own to social mobility.

This conclusion is particularly disturbing in view of the high degree of immobility—both inter-firm and inter-departmental—which prevails among the managers studied. Many factors make for imperfections in the managerial market. The consequence is that this group of firms tends to recruit its managers internally but to pay little attention to discovering potential talent and systematically training and encouraging promising men. The *élite*, those with the greatest chance of attaining high salaries, top positions and directorates, tend to be pre-selected by their education and social advantages. They are accountants and science and arts graduates.

Finally, the author finds little evidence of the emergence of a profession

of management. Managers tend to be divided into discreet groups, each of which has specialist knowledge, distinct methods of recruitment and, to a great extent, different social and educational origins. His empirical evidence does not support a theory of a particular management function; until this is clarified Mr. Clements sees no point in experiments in education for management as such.

CHARLOTTE ERICKSON

London School of Economics.

Womanpower. A Statement by the National Manpower Council with Chapters by the Council Staff. (New York: Columbia University Press (London: Oxford University Press), 1957. Pp. xxxi + 371. 40*s*.)

Womanpower is a report by the National Manpower Council of Columbia University on the position of women in employment in the United States and the problems created by recent changes in this field. The report, which contains a considerable amount of detailed statistical material, traces the historical changes in the position of women in the labour market; examines the opportunities available to women in different types and grades of work and analyses the alterations which have taken place in the age and marital status of women at work. Considerable space is given to an examination of the educational opportunities available for girls and women, and to the relationship between the type of education a girl receives and her subsequent career. The social questions involved in the increased employment of married women are also discussed.

To British readers the most remarkable feature of this report is the close parallel between the development described and the changes which have been going on in the United Kingdom. In both cases a high level of employment coupled with a fall in the average age of marriage and in the age at which child bearing ceases has drastically altered the attitude of women towards employment at different stages of their lives. In both countries the most marked feature is the return of the older married woman to work, after her children have gone to school. According to the report:

> " Of mothers living with their husbands with children aged 6–17 (but not under 6) 35% were working in 1955. Since the majority of women marry before they are 21 and have their first child soon afterwards, a great many mothers no longer have children of pre-school age by the time they are 30. Today it has been estimated, the average mother is only 32 when her last child reaches school age."

In the United States, as in this country, the return of married women to employment is not caused solely by the need to work for the bare necessities of life, since the demand for employment opportunities is found in all income groups. In these circumstances it is not surprising to find in the United

States the familiar emphasis on the need for schemes for retraining older women and for increased opportunities for part-time work.

In the detailed examination of the jobs which women obtain and the obstacles they encounter, the same resemblance between the two countries persists. In manual grades women have tended to be employed predominately in jobs regarded as "women's work," and have found great difficulty in gaining acceptance in employment traditionally established as "men's work." In the professional and executive groups two-thirds of all professional women are teachers or nurses, while less than 5% of all employed women are working as managers, officials, proprietors, and less than 15% of all managerial workers are women.

The volume contains a summary of recommendations by the Manpower Council which include improvements in vocational guidance for girls at school and also for older women through statutory and voluntary bodies; increased opportunities for education and training, both before marriage and for married women who wish to return to work; the removal of sex discrimination in employment and the need for employers to review their employment practices in the light of the type of woman now available for employment. The report emphasises the need to experiment more widely with the development of part-time work and flexible work arrangement and the necessity for greater research into the whole field of women's employment and its wider social implications. In the light of the changes taking place, it suggests that a comprehensive review should be undertaken by the Secretary of Labour into the potential use of the country's resources of woman power and the existing laws relating to the employment of women.

NANCY SEEAR

London School of Economics.

The Costs of Education. By JOHN VAIZEY. (London: Allen & Unwin, 1958. Pp. 256. 30*s.*)

MR. VAIZEY has applied to education in the United Kingdom techniques similar to those used by Professor Titmuss and Dr. Brian Abel-Smith in *The Cost of the National Health Service in England and Wales.* A great deal of labour has gone into the collection and examination of data, and the author acknowledges help from a number of individuals, institutions and authorities; but it is evident that he himself is responsible for the remarkably clear and orderly exposition of the nature of the sources, the method of working and the conclusions which can be drawn. At every appropriate point he warns the reader when he must be cautious in accepting figures and estimates. The result is an excellent study, not by any means difficult to read despite the mass of detail handled in some chapters, which should be of great value to government and local authorities in formulating policy and carrying out administration.

In terms of 1948 prices expenditure on public education rose from £128 million in 1921 to £300 million in 1955. The greatest part of this increase was undertaken after 1946, when the numbers of young people undergoing education were increased, first by raising the school-leaving age and later by the entry into school of "the bulge." Mr. Vaizey is convinced, however, that—

> "population . . . was not the main factor in encouraging the growth of education expenditure. The immediate post-war years in the early twenties, the second Labour Government, the Chamberlain Government and the post-1945 years have in fact marked the fastest rates of growth. These years have been associated with high levels of economic activity . . . it is this which is the probable explanation."

It may indeed be true that a favourable economic climate, with its accompanying painless rise in government revenue, makes public and government more willing and better able to spend more money on education; but if prices—including the prices of educational requirements—are rising rapidly the increase in expenditure may not be matched by an equivalent flow of resources into education. Similarly, when economic activity declines and cuts in expenditure are made—as in the days of Geddes and May—their effects are not so severe as intended or feared. Thus it comes about that (if "social" expenditure on meals, milk and health services be excluded though capital is included) "Expenditure in 1955 was a lower proportion of the national income than in the pre-war years from 1931 to 1935. Expenditure until 1950 was a lower proportion than in almost any pre-war year."

To Mr. Vaizey "this is a striking and melancholy conclusion." In his foreword to the book Professor Titmuss says that an even "plainer comment" would be justified. Yet those who feel this way (as I do) must meet the criticism of others who will point out that it is inevitable that in bad times we should spend a larger proportion of our income upon necessities, and natural that in good times we should want to spend most of the additional income now available to us upon pleasure or upon newly discovered necessities such as motor cars or television sets. The average elector is perhaps inclined to think that present educational provision is reasonably good, if indeed it is not rather extravagant in parts. If we want him to demand something better we shall have to convince him not merely that he can afford it but that his children really need it and that a continuation of expansion in the economy requires a higher output of well-educated people, trained in the use of special skills, than we are yet producing. He must spend enough on buildings and equipment to provide for smaller classes and enough on teachers' training and teachers' salaries to ensure that those classes are adequately taught. Above all, he must be persuaded to "sacrifice" somehow the earnings which his more gifted children can make between fifteen and eighteen, or even between fifteen and twenty-two in order that

they can secure the qualitatively different education which can be obtained only at those ages.

Mr. Vaizey is not a special pleader: at every stage he presents his facts objectively; but again and again the facts lend force to the arguments which the educators must put before the electors. For instance,

> " the parents earning less than £500 a year in 1951 derived £54 m. net benefit from the system, while those earning from £500 to £1,999 derived £30·4 m. benefit and those earning over £2,000 a year lost £84·7 m. . . . Since there are more children in the lower than in the middle income ranges, the benefit per child is two-thirds greater for the child in the middle class than for the working-class. This greater benefit is related to better opportunities available to the middle-class child in the more expensive parts of education, notable at grammar schools, direct grant schools and universities."

Making all reasonable allowances for the possibility (far too conjectural to have entered into Mr. Vaizey's calculations) that children of the professional classes may have some hereditary as well as social advantage over others, these facts indicate clearly that there is still a foolish, not to say shocking, waste of ability in our educational system. The remedy lies not merely in building additionally at the top of the pyramid, but in greatly strengthening its base and its middle storeys.

H. A. MARQUAND

London.

The Chemical Industry During the Nineteenth Century: A Study of the Economic Aspects of Applied Chemistry in Europe and North America. By L. F. HABER. (London: Oxford University Press, 1958. Pp. x + 292. 45*s.*)

" THERE are many histories of chemistry, few of the chemical industry," writes Dr. Haber; and in spite of Dr. and Mrs. Clow's study of the chemical revolution, a few more specific studies like Barker and Harris's study of St. Helens and biographical studies like Mr. Cohen's life of Ludwig Mond, the charge that economic historians have generally neglected the complex process of change in the chemical industry is broadly justified. Dr. Haber, the son of the inventor of the Haber process for the fixation of atmospheric nitrogen, is admirably qualified to fill the gap, and he has done it in this excellent survey. It is not, as he says, a complete account. He is principally concerned, on the inorganic side of the industry, with sulphuric acid, soda ash, caustic soda and bleaching powder—the four products which determined the rate of expansion in the industry as a whole. On the organic side, the emphasis again is on a few products and a single branch of manufacture—dyestuffs.

From the start, Dr. Haber relates his survey to economic conditions.

The rising output of cotton, linen, glass and soap increased the demand for vegetable alkali, while war obstructed the movement of this and other primary commodities. Better methods and materials were made possible by three discoveries: the lead-chamber process for manufacturing sulphuric acid, the Leblanc soda process and Tennant's bleaching process. (It seems to have been the milk shortage, for example, that drove Scottish bleachers to export cotton and linen to Holland for final bleaching.) The early improvements in sulphuric acid and soda manufacture were nearly all associated with French scientists; their introduction into manufacture more often took place in Scotland—a kind of scientific auld alliance. The English came into their own in the 1840s with men like Gossage and Muspratt, though the largest chemical works in Europe was still in Scotland—Tennant's business at Glasgow, which grew round the Scottish textile industry. Tyneside, though lacking salt deposits, throve on its cheap communications with the markets at Hull and London and in Europe. The famous " chemical triangle," bounded by St. Helens, Warrington and Widnes, was still a long way behind in the mid-century.

Once again, in the 1830s, as during the Napoleonic wars, the cutting off of imported supplies of traditional materials stimulated the search for substitutes. The disappearance of Sicilian sulphur, for example, led to processes for recovering sulphur from alkali waste, and for extracting it from gypsum and pyrites. The sulphuric acid process and the soda process gradually became closer together. This was the period when chemistry became fashionable in England and even the S.P.C.K. enlivened their publications with chemical information. University College, much under the influence of Scots and Utilitarians, was already teaching chemistry and added a chair of applied chemistry in 1845.

In America, meanwhile, Scottish principles as expounded by Black's pupils, predominated. By 1820 over twenty colleges were offering chemical instruction. Here, as in France and England, the necessities and deprivations of war proved a powerful stimulus to chemical inquiry and growth. Nowhere was scientific education pursued so systematically or successfully as in Germany; when the spectacular growth of British industry in the 1850s and 1860s slowed down, and even the powerful combination of Eugénie's fashions and the French dyehouses was proved to be economically limited in its effects, it was Germany that was forging ahead with the new dyestuff processes. A large part of the story of the relative decline of the British chemical industry at this period can be summarised in the decline of the Leblanc soda process and the " arrest " of the British dyestuffs industry. Against this must be placed the rise of Brunner Mond and the Solvay process.

Dr. Haber has produced a close-knit survey of world development in a vital industry. To say that it has a kind of massive competence is by no means to imply that it is dull, for its construction reflects all along the organic character of the growth and the dynamics that underlay it. The

relationship between demand, fashion, war, social changes and the growth and changing technology of the chemical industry is never forgotten. The relative fortunes of the dye industry in England and Germany are analysed convincingly. So are the effects of technology on the size and structure of individual firms, on law, policy, labour relations and regulations. Nor does the author forget the contribution of individual entrepreneurs. Dr. Haber's book is not easy reading, but it repays the attention it demands; and it is indispensable for a balanced knowledge of industrial development in the nineteenth century.

CHARLES WILSON

Jesus College,
Cambridge.

The Economics of Man-made Fibres. By DOUGLAS HAGUE. (London: Duckworth, 1957. Pp. 315. 30*s*.)

PROFESSOR HAGUE's book is one of those in the Industrial Innovations Series: a series of works by members of the Department of Political Economy, University College, London, in which an attempt has been made to investigate "the circumstances which predispose an industry either to welcome innovations or to obstruct them." Professor Hague has interpreted his brief widely. His discussion covers not only the problems involved in the manufacture of man-made fibres but also the impact of man-made fibres on the traditional textile trades. Indeed, well over half the book is devoted to this latter topic. The author points out that much of the information he gives about the man-made-fibres industry was already available in published form, but that a good deal of field study was necessary before the chapters on the use of man-made fibres in the traditional textile industries could be written. These chapters embody much interesting new material, but even the earlier chapters on the man-made fibres industry contain a fuller and more complete study of their subject than has previously been available.

The longest of the chapters on man-made fibres is naturally that which is devoted to rayon. Most of this chapter is taken up with a chronological account of the development of the rayon industry in this country. Attention is paid to innovations, but this is only one subject among many: price policy, cartels, international trade and the structure of the industry are among the other topics discussed. As an historical account this is well done, and Professor Hague has many interesting things to say on such matters as Courtaulds' price policy in the 1930s and on the historical reasons for the difference in character between Courtaulds and British Celanese before their merger. He also makes some shrewd judgments about what rayon producers were thinking about future markets in the immediate post-war period. The structure of the chapter, however, precludes a full discussion

of such questions as costs of production in the industry and the relationship between costs, scale of output and price policy. Professor Hague's remarks on this subject are not entirely clear, and could have been amplified with advantage. Another question that is dealt with rather cursorily is that of the strength of the British rayon industry in relation to its competitors overseas.

Professor Hague devotes a good deal of space to man-made fibres other than rayon, principally nylon and terylene, and tells the fascinating story of the invention and development of these fibres in some detail. He contrasts the amount of research devoted to the discovery of nylon and terylene, and points out that although terylene was discovered comparatively cheaply because of the pioneer work that had already been done on nylon, the expense required to bring terylene to commercial production was on the same prodigious scale as that for nylon. He concludes that " whilst the inventor of a man-made fibre need not always spend a fortune on doing so, the commercial innovator has to be on the scale of a Courtaulds or an I.C.I."

The second part of the book, on the impact of man-made fibres on the traditional textile trades, contains chapters on the hosiery trades (written in conjunction with D. Berry), the cotton industry, the wool textile industry, and textile finishing. There is a final chapter of general conclusions. In these chapters Professor Hague sets out very fully all the relevant statistics and provides new figures of his own on some topics. He has based these chapters on wide reading, much of it in the technical journals, as well as on interviews, and one admires his grasp of technical detail in the textile and engineering fields. Sometimes it is a little difficult, especially when faced with a large number of statistical tables, to see the wood for the trees in these chapters; nor are they always easy reading, but it is well worth the effort for the considerable amount of valuable detail that they contain. Among many other subjects, Professor Hague has much of interest to say on the conditions under which rayon is substituted for cotton, on geographical specialisation in rayon in Lancashire and on the relationship between size of firm and willingness to introduce man-made fibres. He reaches the conclusion that the enthusiasm of the textile industries for new man-made fibres seems to have varied in proportion to the suitability and desirability of the fibre in question, and that there is no evidence that the traditional textile industries have failed to interpret and meet the demands of consumers for fabrics containing man-made fibres. Where the traditional textile industries have been least successful, in his view, is in the machinery field, but Professor Hague suggests that this is only one aspect of a malaise that appears to affect the textile-machinery industry as a whole.

Professor Hague's general conclusion on the subject of the man-made-fibres industry itself is that monopolistic and competitive forces are present in the industry in more or less the right proportions. He was writing before the merger of Courtaulds and British Celanese, but it seems unlikely that he would want to modify his conclusions greatly in the light of that event. As

he points out, rayon faces so much competition from natural fibres, as well as from other man-made fibres, that rayon producers have every incentive to manufacture as efficiently as possible and to seek actively to improve their product.

In his introduction Professor Hague says that he has written, in effect, an economic history of the man-made-fibres industry. This is indeed a better description of the contents of the book than that implied by its title, which suggests a more extended economic analysis of the industry than we are in fact given. In the field he has chosen to write about, however, Professor Hague has covered a very wide canvas and has presented a great deal of new information in a clear and interesting manner. All students of the textile industries must certainly read his book.

AUBREY SILBERSTON

St. John's College,
Cambridge.

The Economic Development of Radio. By S. G. STURMEY. (London: Duckworth, 1958. Pp. 284. 30*s.*)

THIS is one of a series of case studies on industrial innovation presented by economists at University College, London. Dr. Sturmey has chosen the radio industry for his consideration and more specifically three major innovations in its development—marine navigation, point-to-point communications and broadcasting. He seeks to answer two main questions—What have been the main conditioning forces of technical progress in these fields? Which is the industrial structure most conducive to the rapid invention and application of new processes and techniques?

It is not long before we learn that, of the various determinants of innovation in the radio industry, two stand out as being of especial significance—Government policy and the conditions surrounding the entry of new firms. Concerning the former, following its early established control over coastal wireless stations and internal telegraphic communications, the State has influenced the application and development of radio in three main directions: first, by its interest in the organisation of overseas radio services; secondly, by its monopoly of domestic broadcasting; and thirdly, by its large-scale purchase of wireless equipment. Dr. Sturmey believes that such a participation has both retarded and accelerated technological growth. For example, on the one hand, he cites the Post Office as frustrating the speedy introduction of an Imperial radio network by its refusal to grant an operating licence to the Marconi Company (which was prepared to undertake the necessary installation work) at a time when it had neither the facilities nor the desire to offer any alternative system; on the other, he suggests that the decision of the British Broadcasting Corporation to experiment with the Baird system of television transmission in 1929 was a risk which, at that time, competitive systems in other countries were not prepared to take.

Economic theory rightly acknowledges the importance of entry conditions as a factor influencing market situations and pricing policy, but Dr. Sturmey has provided us with some very valuable empirical evidence of its effects on the rate of technical progress. As regards the radio industry, it appears that while structural factors largely control the *ability* of a firm to innovate, it is the conditions surrounding entry which will determine its *desire* to do so. In general, Dr. Sturmey argues that progress is most likely to be rapid where entry is unimpeded and where the existing competitive structure is oligopolistic. Naturally, of course, the exact nature and significance of the external stimuli will vary over time and according to the section of the industry being discussed. Thus the early conditions of entry in the domestic radio industry were such that a prospective entrepreneur needed to possess only the minimum of capital and technical knowledge to supply broadcast receiving sets. But to-day in some of the more complex branches of the industry, where research is an important determinant of progress, large initial capital requirements preclude any such Marshallian influx of firms. Instead the main source of potential competition originates from established firms on the fringe of the radio industry whose productive capacity is sufficiently flexible to produce radio apparatus should the need arise.

Any attempt to label a particular type of industrial structure or condition of entry as being that most conducive to innovation is further complicated for two other reasons. First, even within a particular industrial structure the competitive relationship which exists between firms producing the same products is rarely a symmetrical one. For example, the electronics industry consists of three types of firms—the branchers, specialisers and assemblers. By definition, however, the first group of firms (which are amongst the largest in size) compete in other fields, and in consequence are less likely to be affected by than to affect their competitors' policy. Secondly, Dr. Sturmey's conclusions apply primarily to what he terms the *evolutionary* innovations or those consisting of " the use of a greatly improved technique, or a new technique which is related to existing techniques, to do something which is already being done " (p. 258). As for the *revolutionary* innovations, which arise on the introduction of a completely new technique or product likely to affect profoundly the course of development, for instance, radio for point-to-point communications, television, wire relays and the like, these, it would seem, rarely originate from within the industry itself whatever its structure.

There is much to attract the economist in Dr. Sturmey's book. In spite of a not very propitious start with a highly technical account of the development of the valve, the author soon shows where his main interests lie. Chapters VIII and IX, which trace the origin and development of domestic broadcasting, perhaps contain the best case material for the applied economist, and it is here too that we are given a brief description of the present-day structure of the radio industry. However, this is very much an *obiter dicta*, and it is a pity that Dr. Sturmey did not feel able to extend his researches a

little further in this respect, and also provide us with more statistical data about this fascinating but little studied industry. Nevertheless, the book, as a whole, shows evidence of a very thorough and competent piece of research, presented in a way which makes absorbing reading. The author has also produced a number of interesting by-products. Teachers of elementary economics have cause to be grateful for a very good practical illustration of the significance of demand elasticity to add to their repertory (pp. 75–6); students of monopoly will find much to intrigue them in Chapter XI, which is devoted to the subject of patents; and those who wish to be reminded of ways in which foreign capital and enterprise may affect an industry's technological growth are given a number of illuminating glimpses (pp. 171 and 264 among others) into the role played by American affiliated firms in the British radio industry's development.

J. H. DUNNING

University of Southampton.

Inland Transport. By C. I. SAVAGE. *History of the Second World War, United Kingdom Civil Series.* (London: H.M. Stationery Office and Longmans, 1957. Pp. xvii + 678. 47*s.* 6*d.*)

MR. CHRISTOPHER SAVAGE writes in detail of inland transport in the United Kingdom during the Second World War. He begins with an account, necessarily sketchy since so little is known, of the trade from 1920 to 1939. We are told of the preparations made before September 1939 in expectation of the outbreak of war, most of which were misconceived, principally it appears because Government—or at least, the departments of Government chiefly concerned—over-estimated both the efficiency of aerial attack and the latent capacity of the railways to handle an increased traffic. The railway companies, moving less freight and passengers in the third decade of the twentieth century than in the first, argued that their equipment was therefore under-utilised. Government, fearful of attack from the air, foresaw the closing of the east coast ports and the need for a wholesale diversion of imports to the west. Air attack on the east was more severe and the losses of landed cargo might certainly have been less had it been possible to divert more. But road transport was deliberately confined to conserve fuel and the railways just could not handle the load. The number of passengers was rising and journeys were lengthening. There was no rationing of travel by train, and passenger services could not be cut by the 70% which had been assumed. The Ministry of Transport finally came to realise that freight in unaccustomed places and consigned over unusual routes could not be handled with the expedition demanded by war unless traffic were transferred from the railways and not to them. The unpleasant fact was not fully recognised until the winter of 1940/41. The

initial mishandling of transport must by then have been aggravating the direction of the war economy at large.

Mr. Savage's exposition is dictated by the circumstances of the times of which he writes. His period falls into four—prelude, comprising the months of the " phony " war in 1939 and 1940; twelve critical months in 1940 and 1941 when the battle was joined; austerity from 1941 to 1944; victory and preparation for reconstruction in 1944 and 1945. The course of events for each of the agencies of inland transport—railways, road passenger, road goods, canals and inland waterways and coastwise shipping—is recounted separately in these chronological divisions and we are provided with a discussion of the administrative problems calling for resolution. This reader, at least, did not realise (though no doubt he should have) that the Ministry of Transport had already anticipated in the war-time Road Haulage Organisation the fabric on which the British Transport Commission were able to build so unexpectedly rapidly the nationalised services of the Road Haulage Executive.

The reviewer was impressed by the machinery which had to be elaborated " to ensure that diversions of Government traffic from one form of inland transport to another were made with the object of using all available capacity to the best advantage and *not because of the difference in charges* " (p. 565, reviewer's italics). He knows the good reasons there are for not interfering with prices during war. But resources might have been allocated so much more effectively if the prices of the competing services had been used to work with the machinery of direction instead of against it. This is surely simple enough. But it is a truth the relevance of which does not seem to have been grasped by those responsible for transport policy until at least 1953. That was ten years after the railways had first been run as one by the Railways Executive Committee and as long after an official Road Haulage Organisation had had to be brought into being by the Ministry of Transport specifically to resolve the problems created by the attempt to supersede, in handling the large block of traffic consigned on Government account, " the normal economic criterion of cost in determining by what means a particular traffic should move " (p. 586).

Transport, considering the value of its contribution to the gross national product, is most inadequately recorded in the statistics. Passengers carried by public-service vehicles (buses) have been returned since licensing began in 1930. The deficiency, so marked in the statistics of freight, has now been made good, in part at least, by the survey of the work done by a sample of lorries and trucks undertaken by the Ministry of Transport in 1952 and repeated again this year. But there was not even this much during the War. Mr. Savage on no less than eighteen occasions has to observe how the lack of adequate statistics added to the burdens of administrators.

Mr. Savage has written a book which, though undoubtedly long, is both interesting and informative. Official memoranda are reproduced in

appendices to the relevant chapters, together with statistics and notes. Twelve tables are collected at the end and there is an index of seventeen pages. This contribution to the History of the Second World War should be as useful to the historian of democracies wrestling with the problems of total war as it was to one student at least of the economics and organisation of transport.

GILBERT WALKER

University of Birmingham.

The Regulation of Rail–Motor Rate Competition. By ERNEST W. WILLIAMS, Jr. (New York: Harper, 1958. Pp. ix + 247. $4.50.)

THE Interstate Commerce Commission is the body authorised by the Congress of the United States of America to administer the Transportation Act of 1940. That Act declares the recognition and preservation of the inherent advantages of carriers by rail, water and road motor to be a part of the national transportation policy; but the Act and the Commission between them have, so we are told, tended instead to confirm the competitors " in whatever areas they may have been able to carve out for themselves " (p. 15). Professor Williams describes, with a wealth of citation, how the Commission have decided the rates which should be charged for the services of competing carriers. With an appreciation of change which the British Railways never gave the appropriate authority (wasn't it the Railway and Canal Commission?) an opportunity of showing, the I.C.C. have been prepared to allow competition to justify the creation of a preference which might otherwise have been undue and therefore illegal; and they have on occasion accepted a reduction which brought rates for the longer distance below the shorter in apparent disregard of the long- and short-haul clause. But they have been careful not to allow reduction by more than the amount demanded by the competition of which complaint was laid and they have at all times sought to ensure rates which would offer a reasonable compensation to the carrier.

The rates published by the motor-rate bureaux and filed with the Commission may not be the charges actually made by the individual and often highly independent motor carriers and the amount with which the trader debits himself as the cost of doing his own carrying is not brought within the jurisdiction of the regulating authority. The first is a possibility not really considered by Professor Williams—it is not in any case subsumed under his title—but he refers on many occasions to the impact of competition, realised or potential, from traders who do, or who might, carry their own goods. The private carrier is a nettle which neither Congressmen nor Members of Parliament have so far grasped. They may have to before long.

Regulation in the United States, as in the United Kingdom, far from co-ordinating has helped to dis-ordinate transport. Motor carriers " are retained and encouraged further to develop in a service for which they have an apparent cost disadvantage " (p. 214), a situation which " maintains an excessive number of carrier services all operating at unit costs above the attainable optimum " (p. 215). To insist that rates by rail and road be the same and to eliminate differences otherwise justified by cost deprives the trader of effective choice. Uncontrolled competition shows " no tendency to reach an equilibrium position " (p. 225). Competition between railways supplying a heterogenous output from a common equipment with carriers by road able, or so it is believed, to arrive at a significant figure for their fully allocated costs is still the problem. The Cost Finding Section of the I.C.C. have been elaborating their inquiries but these awkward questions are as little resolved now as they were twelve years ago when the reviewer was writing about the territorial (motor) class rate investigations first opened in 1937 and 1938. Professor Williams, on his final page, remarks that the Commission " thus far have not faced the issue " of one carrier able to cover all his costs at a rate which leaves another something over his out-of-pocket expenses but not enough, may be, to avoid the imposition of " an undue burden on the aggregate of transport costs."

Professor Williams assumes a greater knowledge of the powers and practice of the I.C.C. than most English students are likely to possess. He makes use, too often to one reader's mind, of those ellipses which trans-atlantic authors (mistakenly) consider an aid to brevity. The clarity of his many references and footnotes suffers from *ibid.* and *loc. cit.* On p. 82, three pronouns in lines 8 and 9, all in the third person plural refer to two distinct subjects. The meaning can be guessed but the expression is needlessly ambiguous. Cases cited occupy nineteen pages—a useful list but one which would have been so much more valuable had the cases been arranged under the precedents to which each leads. There is no index, as there certainly should be in a book of this kind. But these defects must not be allowed to obscure the value of Professor Williams' considerable contribution to the practice of price fixing in a controlled but a competitive market.

GILBERT WALKER

Birmingham University.

Pre-famine Ireland, a Study in Historical Geography. By T. W. FREEMAN. (Manchester: The University Press, 1957. Pp. viii + 352. 35*s.*)

BEFORE the famine Ireland had two economies, one a primitive subsistence economy in which three-quarters of the people lived and the other a commercial-exchange economy linked with Great Britain. The famine represented the final catastrophe of the primitive economy, and the outflow

of people and the inflow of cash merged the whole of Ireland into the economic system of the British Isles. After so great an emigration for so long, the detritus of the old order survives; the visitor to Ireland is shocked by the dereliction and decay, some of it dating from the withdrawal of the active commercial classes at the time of the troubles, but much of it showing the wide extent of the old order and the failure of the new economy to make use of its marginal land and its unsophisticated labour. A subsistence economy uses all resources with equal intensity, because specialisation is limited; when the market arrives, the least rewarding parts of the soil are abandoned.

Professor Freeman's book draws a picture of the two economies just before they coalesced. He has made wide use of contemporary and secondary sources, as well as his more intimate topographical knowledge, to reconstruct the economic life of Ireland before the famine. The book has useful maps, and (apart from an inadequate index and the infuriating practice of putting references at the back) it will serve as a valuable aid to the historian of the Irish economy. It would have been strengthened had it made use of modern economic analysis, because in its pages the basic economic explanation of the famine is not touched on; the monetary history of Ireland is neglected and the significance of the absence of money in the subsistence economy is not grasped. Within these limitations, however, the book raises many interesting questions and confirms much that is known about the pre-monetary economies.

The basic Irish paradox is how so primitive an economy endured for so long alongside the most advanced economy in the world. The major explanation has to do with deflation after 1815, when the Irish currency was drastically revalued, but there are other factors—the different language, the persistence of Roman Catholicism and the continual threats of treason which frighten away venture capital. The usual explanations are, in a sense, all subsidiary to these, because the dependence on the potato, the overcrowded land, the primitive techniques, the lack of town life and the rate of saving were all manifestations of the subsistence economy and not reasons for its existence. A second problem is the lack of growth in the exchange economy. This is mainly explained by the area's monetary history and especially the severe deflation, but the lack of raw materials, poor communications and lack of an effective entrepreneurial class played their part. As Professor Freeman points out, however, all these difficulties have been exaggerated; Ireland's sea and canal communications were good, and the railways when they came were adequate—and little used; there were some raw materials; and there were some entrepreneurs. Possibly the country was in a sense swamped by the great army of under-employed which made any attempts to improve the country seem puny beside the problem they were designed to solve.

Out of an employed population of 3½ millions in 1841, 52% were engaged in agriculture, 25% in textiles and clothing and 20% in domestic service.

This is a division of labour which yielded an adequate but unexciting standard of living; the potentialities of development seemed to be too difficult to discover. Professor Freeman's study is valuable because it emphasises the immense amount of change that was already taking place before the famine; the old order was already breaking down and would have passed even if the potato had not failed for five years in succession. The local variety of a subsistence economy provides the points of growth whether or not a tide of disaster sweeps away the economy in which they stand.

JOHN VAIZEY

Oxford.

Harold Adams Innis. Portrait of a Scholar. By DONALD CREIGHTON. (Toronto: Toronto University Press (London: Oxford University Press), 1957. Pp. 146. 24*s*.)

"IN the first pale fine days of early March, he foraged about for bits of firewood, while the maple sap bubbled lusciously in the great iron kettle" (p. 9). It conjures up for me a memorable Easter week-end at the Innis' home in Oxford County, Ontario. The night before we had fixed the tins on the trees: early next morning lighted our shallow fire, fed it with sticks hour after hour, scooping away the froth and talking the while of Veblen, "tie-ins," Canadian Wheat Pool and the amiable weaknesses of our friends. That evening his mother cleared the syrup by stirring it with a linen bag of egg-shells and next morning we had it for breakfast. Mr. Innis, senior, told us of the days when they worked with their iron kettle along a concession, and Harold's brother, Sam, showed me over his new tobacco-curing plant.

In this delightful study of Harold Adams Innis (his mother was an Adams) Dr. Creighton tells the story of a scholar and a school, the scholar a great economic historian, the school a distinctive school of Canadian economic history, of which he was the leader. In a fruitful life, hard but not harsh, there was but one deep shadow, the cancer that killed him at fifty-eight, aggravated, perhaps, by the multiple activities that forced themselves on him in his last years. We follow him from Section School, High School, Collegiate Institute, Woodstock (where he met Hubert Kemp), to McMaster University, housed then beside the University of Toronto: its building (since the removal to Hamilton) the *ultima domus* of Innis and the Department of Political Economy, of which he became the head in July 1937. He took his Ph.D. at Chicago (subject "The History of the Canadian Pacific Railway"), meeting there his future wife, Mary Quayle, herself later a writer in his field and now Dean of Women in Toronto. In July 1920 he accepted a lectureship in economics in the University of Toronto. A year later I joined the Department, and was his colleague for ten years. His History, with its long

geographical introduction, furnished the motif of his future thought; for it taught him that the C.P.R. had, through the new medium of rail transport, recaptured an older economic unity, based on the St. Lawrence and Great Lakes. "The present Dominion emerged not in spite of geography, but because of it"—in his own words: and he applied this leading idea to a survey of the staples of Canadian history, produced on one continent and sold to another by direct east–west contacts of French and English provenance.

In *Trek* (*Economic History Review*, 2nd series, Vol. X, No. 3), Sir Keith Hancock speaks of "a man like Harold Innis who found the dynamic of Canadian growth in a procession of markets—for fish, furs, timber, wheat, metals." But he was very far from indifferent to personality. Indeed, it was in the scope for individual initiative that he found the connecting thread of his commodity studies. He was, of course, greedy for documents, but he belived in boots as much as books, and that took him in a canoe to the mouth of the Mackenzie River in 1924. In a chapter on the Canadian Maritimes for the *Cambridge History of the British Empire*, under our joint names, I supplied the frills of style and he the governing idea and supporting facts for a maritime economy, rugged, like its coast-line, and facing the sea, which had brought its prosperity, but compelled now to turn landwards, losing thereby some of its institutions and ablest men to the continental mainland north and south of the border—a theme which he developed later in his collateral Report of 1934 to the Royal Commission on Nova Scotia. I read, I think, all he wrote in book form down to his magnum opus of 1940, *The Cod Fisheries, the History of an International Economy*. This last I made my bible during my two summers in Newfoundland, 1952 and 1953; and it never failed me.

From 1938 onwards, honours (and duties) crowded on him: 1938, President of Canadian Political Science Association; 1945, air trip by invitation to Moscow and Leningrad, from which he returned with strong views upon the need for co-operation between Russia and the Anglo-Saxon world; 1946, President of Royal Society, Canada; 1947, Dean of Graduate School; 1948, Beit Lecturer, Oxford (Empire and Communications); 1948–49, Royal Commission on Transportation, involving an exhausting programme of mid-weeks at Ottawa and busy week-ends at Toronto; 1951, President Elect of American Economic Association. Chicago sought to get him back on his own terms towards the close of the Second World War, but he was too devoted to Canada and its problems to leave his native country, especially at a time when he was holding the academic fort for the youth who would be shortly returning, as he had returned, a wounded gunner, from Vimy Ridge in July 1917. Strangely enough, with my Machine Gun Company at Lens, I must have been close to him that spring! When we met at Toronto in 1921, he found me, I know, rather "imperialistic," but it did not take me long to find that his was the sort of imperialism after which I was feeling.

Alfred Marshall, Maynard Keynes, General Lindsay of the Machine Gun Corps, Harold Innis—truly in my friendships I have been blessed above the ordinary.

C. R. FAY

Belfast.

Stability and Progress in the World Economy. The Record of the First Congress of the International Economic Association, with Addresses by DENNIS ROBERTSON, JACOB VINER, FRANCOIS PERROUX, GOTTFRIED HABERLER and ERIK LUNDBERG. Edited by D. C. HAGUE. (London: Macmillan, 1958. Pp. xv + 267. 25*s*.)

THE first Congress of the International Economic Association held in September 1956 was a very memorable occasion for all who attended it. First, there was the delight of being in Rome, which in the new Italy has now more than ever become an attractive city to visit. Then there was the opportunity of an audience with the Pope (of which I am afraid I was one of the few not to take advantage). Above all, there was the kindness and hospitality of Professor Papi, both an economist of international reputation and the Rector of the University. Secondly, the Congress provided a unique opportunity of meeting colleagues from other nations. For the young there was the satisfaction of being face to face with the owners of famous names; there was Sir Dennis Robertson dissecting the problems of the advanced countries with his usual charm, and there was François Perroux, bubbling with ideas; for the more experienced there was an almost equal interest of meeting the rising generation of economists of other countries, perhaps specially the West Germans, who were almost unknown to us. Finally, there was the pleasure of welcoming for the first time at an I.E.A. meeting economists from the iron curtain countries: Russia, Czecho-Slovakia, Hungary and Poland.

This volume of the proceedings, ably edited by Professor Hague, is a worthy memorial of the Congress. Those who now read the contributions for the first time must, however, not be surprised that the originality of the thought as it emerges in the record is rather less than might have been expected from such an august assembly. In a meeting of this sort it is always in the off-stage discussions, in little groups in cafés (aided no doubt by cassatti and vermouth), that the most progress is made, and these cannot be recorded. Further, there was a real difficulty in getting ideas of any complication across to such a large and heterogeneous audience.

The procedure laid down was in most cases fruitful and appropriate. The main contribution was followed by two set criticisms by equally experienced economists, who had had the opportunity of a preview of the paper; the subject was then thrown open for general discussion. The technical arrangements were as good as could be; microphone for the speakers, ear-

phones (with most useful amplification) and simultaneous translation (which, however, obscured the meaning as often as it clarified the words), these ought to have enabled everyone to follow. But in fact it was extremely hard to grasp the whole of a close-knit argument, including the qualifications, and this led to a good many misunderstandings. (Professor Viner's paper suffered especially.) Speakers thus faced an awkward dilemma between being too subtle to be followed and too obvious to be interesting.

Perhaps the most successful contribution in this respect was that of Professor Lindahl, speaking second to Professor Haberler. The question at issue was whether full employment could be maintained indefinitely without an intolerable degree of inflation, a very burning problem in 1956 when it was still uncertain whether monetary authorities would face up to a tough credit squeeze, and if they did whether it would be effective in modern conditions. Professor Haberler had put his faith in the growth of productivity in the United States, and presumably in its ability to carry other nations with free institutions along with it. Professor Lindahl, with a faith that has already largely been justified, stoutly argued, first, that a profit inflation *could* be brought under control by monetary means, and secondly, that a cost (wages) inflation could be treated in a number of ways, especially since countries with strong trade unions tend to be countries with a sufficiently high standard of general education for workers to be able to understand the economics of the situation. Professor Lindahl stressed particularly a point which has since received a great deal of attention: the importance of being able to assure workers of a reasonably steady price level.

Perhaps the most distinguished paper was that of Professor Viner. It also gave rise to the liveliest (and most acrimonious) discussion, as will be apparent from the Proceedings. Professor Viner was (no doubt deliberately) provocative, in particular in his condemnation of the use of the concept of Disguised Unemployment in underdeveloped countries. He went so far as virtually to deny the existence of the phenomenon, although with an important qualification which was almost universally missed. Professor Viner assumed that it was claimed by the protagonists of the concept that *long-run* zero or even negative productivity could exist among peasant farmers. In discussion it became evident that Professor Vakil and his friends had in mind a much less restrictive definition, and indeed were putting a lot of faith in the possibility of raising agricultural productivity by small improvements in practices, many of which would require only minimal investment.

Other important contentions of Professor Viner were that while the evils of inflation may well be less in underdeveloped countries where long-run bonds and long-term contracts are relatively unimportant, the possible benefits, providing incentive for investment and scope for forced saving, are not likely to be substantial. It was also very usefully emphasised that in respect of external economies it is the economies *net* of diseconomies that matter, a point that is frequently overlooked by planners. In respect of population problems

Professor Viner pointed out that these may be serious, quite apart from the rate of increase, if there is an excessive ratio of present population to natural and other resources, a high ratio of present population to labour force, or a high ratio of dependants to total population. Of all resources, only human scarcity is desirable, and a complicating factor is the extreme cheapness of medical aid in improving health and expectation of life, far cheaper than any other " aid " which developed countries can bestow.

A final warning: notwithstanding the title of the book, readers will find very little about stability and progress in the world economy. Everyone argued in terms of the country or countries which were known to him. The approach was in this sense more micro than macro. Professor Lundberg alone (International Stability and the National Economy) could not escape from the world economy, and consequently found that he had far too many things to talk about for the time allotted to him. However, in the long run, the most important thing about the Congress was the personal give and take which it promoted. Professor Dyachenko put this nicely when he expressed the wish that " our contact that has been started at this Congress, be constant and fruitful, in the interest of the development of economic science and in the interest of the economic progress of all peoples." I hope that he would agree that in the two years which have elapsed since that time we have made some definite progress along the right path.

URSULA K. HICKS

Oxford.

NOTES AND MEMORANDA

CONSISTENCY BETWEEN SAY'S IDENTITY AND THE CAMBRIDGE EQUATION

THE impression is sometimes given that the introduction of a quantity-theory equation to determine absolute prices in a Say's Identity economy is an inconsistent procedure, *i.e.*, that a system of equations consisting of: (*a*) a set which satisfies Say's Identity, and (*b*) the Cambridge equation, for example, is necessarily self-contradictory. The purpose of this note is to show that two standard proofs which have been advanced to demonstrate this proposition do not support it.

Consider an exchange economy with $(n-1)$ commodities and paper money. We have

$$D_j \equiv f_j(p) \tag{1}$$

$$S_j \equiv g_j(p) \tag{2}$$

$$D_j = S_j \quad (j = 1, \ldots n) \tag{3}$$

(1) and (2) are the demand and supply equations, (p) is shorthand for $(p_1, \ldots p_{n-1})$ ignoring p_n (assuming $p_n \equiv 1$ for paper money), and (3) are the equilibrium conditions. The above may be simplified by

$$D_j - S_j \equiv X_j(p) \tag{4}$$

to

$$X_j(p) = 0 \quad (j = 1, \ldots n) \tag{5}$$

Accepting Walras' Law, a tautology, we have

$$X_n(p) + \sum_{i=1}^{n-1} p_i X_i(p) \equiv 0 \tag{6}$$

where $X_n(p)$ is the excess demand for money. It follows from (6) that equations (5) are not independent.

Consider now the $(n-1)$ equations

$$X_i(p) = 0 \quad (i = 1, \ldots n-1) \tag{7}$$

which involve $(n-1)$ variables. It is assumed that the D_i and S_i, and hence the $X_i(p)$ $(i = 1, \ldots n-1)$, are homogeneous of degree zero in (p). That is,

$$X_i(p) \equiv X_i(\lambda p) \quad (i = 1, \ldots n-1) \tag{8}$$

We can deduce from (6) the identities

$$\lambda X_n(p) + \lambda \sum_{i=1}^{n-1} p_i X_i(p) \equiv 0 \tag{9}$$

and

$$X_n(\lambda p) + \sum_{i=1}^{n-1} \lambda\, p_i X_i(\lambda p) \equiv 0 \tag{10}$$

and from (8) we can get

$$\lambda \sum_{i=1}^{n-1} p_i X_i(p) \equiv \lambda \sum_{i=1}^{n-1} p_i X_i(\lambda p) \tag{11}$$

Hence, from (9), (10) and (11),

$$\lambda X_n(p) \equiv X_n(\lambda p) \tag{12}$$

i.e., $X_n(p)$ is homogeneous of degree one in (p).

Now Say's Identity is

$$-\sum_{i=1}^{n-1} p_i X_i(p) \equiv 0 \tag{13}$$

This and Walras' Law (6) give

$$X_n(p) \equiv 0 \tag{14}$$

i.e., excess demand for money is identically zero. More pointedly, (12) and (14) give

$$X_n(\lambda p) \equiv 0 \tag{15}$$

so that, since λ is arbitrary, (p) is indeterminate in the system.

However, it is possible that relative prices $z_i \equiv p_i/p_{n-1}$, $p_{n-1} \neq 0$, are determinate. Referring to (8), we set $\lambda = 1/p_{n-1}$ and get

$$\begin{aligned} X_i(p_1, \ldots p_{n-1}) &\equiv X_i(z_1, \ldots z_{n-2}, 1) \\ &\equiv Z_i(z_1, \ldots z_{n-2}) \quad (i = 1, \ldots n-1) \end{aligned} \tag{16}$$

Then (7) and (16) give

$$Z_i(z_1, \ldots z_{n-2}) = 0 \quad (i = 1, \ldots n-1) \tag{17}$$

We see that (17) is $(n-1)$ equations involving $(n-2)$ variables. This fact, however, is not sufficient ground for the inference that the system is therefore inconsistent. When a system of m equations involves $r < m$ variables the *a priori* conclusion is that the system is either: (a) not consistent, or (b) not independent. (See W. B. Hickman, "The Determinacy of Absolute Prices in Classical Economic Theory," *Econometrica*, XVIII (1950), pp. 9–20. This presentation essentially follows Hickman's.) Hence, if it is assumed that the system is consistent it can be concluded that it is not independent, *i.e.*, any solution of $(n-2)$ equations in the system is a solution of the $(n-1)$th equation. But also, we cannot say without more information that there is a unique solution for the z_i.

Include now the Cambridge equation in the form

$$k \sum_{i=1}^{n-1} p_i S_i = M \tag{18}$$

Since $p_i \equiv z_i \cdot p_{n-1}$, this is the same as

$$k p_{n-1} \sum_{i=1}^{n-1} z_i S_i = M \tag{19}$$

If equations (17) have a unique solution, absolute prices can then be determined by observing that the S_i $(i = 1, \ldots n-1)$ are homogeneous of degree zero,

$$S_i \equiv g_i(\lambda p_1, \ldots \lambda p_{n-1}) \quad (i = 1, \ldots n-1) \tag{20}$$

so that putting $\lambda = 1/p_{n-1}$ and $z_i \equiv p_i/p_{n-1}$, (20) is

$$S_i \equiv g_i(z_i, \ldots z_{n-2}, 1) \quad (i = 1, \ldots n-1) \tag{21}$$

Consequently, with the z_i known from (17) the S_i are determined. Substituting them into (19), the value of p_{n-1} is determined, since M and k are given constants. Then $p_1, \ldots p_{n-2}$ are also known from $p_i \equiv z_i \cdot p_{n-1}$.

This procedure was claimed by Lange to be self-contradictory (O. Lange, "Say's Law: A Restatement and Criticism," in *Studies in Mathematical Economics and Econometrics*, ed. O. Lange *et al.* (Chicago, 1942), pp. 49–68). According to Lange, (19) is not compatible with Say's Identity. His argument is as follows: The equation

$$kp_{n-1}\sum_{i=1}^{n-1} z_i S_i - M = X_n(p) \tag{22}$$

is true. But (14), deduced from Say's Identity, is

$$X_n(p) \equiv 0 \tag{23}$$

Hence, Lange says, we obtain

$$kp_{n-1}\sum_{i=1}^{n-1} z_i S_i \equiv M \tag{24}$$

"*i.e.*, an identity, which holds for *any* value of p_{n-1} and, therefore, cannot serve to determine p_{n-1}. But k cannot be constant and must be indeterminate to adjust itself to any value of p_{n-1} so that the identity be satisfied" (*op. cit.*, p. 65).

It is sufficient to point out here, what seems to have escaped notice, that the inference from (22) and (23) to (24) is not valid. The last is a relation stronger than that contained in (22). The form

$$\begin{aligned} A - B &= C \\ C &\equiv 0 \\ \therefore A - B &\equiv 0 \end{aligned}$$

is invalid.

Patinkin's proof in his *Money, Interest, and Prices* (Evanston, Ill., 1956, pp. 334–5) is based on the proposition that the excess demand function for money in the Say's Identity system has a formal property which that function as contained in the Cambridge equation does not possess. *I.e.*,

$$-\sum_{i=1}^{n-1} p_i X_i(p) \tag{25}$$

which is the excess demand function for money (see equation (6)), is homogeneous of degree one in (p), while

$$k\sum_{i=1}^{n-1} p_i S_i - M \tag{26}$$

expresses the excess demand function for money in the Cambridge equation and this expression is non-homogeneous. Thus, Patinkin concludes, the system is "internally inconsistent." Presumably, inconsistency is shown when a solution (p) of the whole system (the Cambridge equation included) is arbitrarily changed to (λp), which, though still satisfying that part of the system excluding the Cambridge equation, will no longer satisfy the Cambridge equation.

This argument makes odd use of the term "inconsistent." If such a (λp) did not satisfy the Cambridge equation the obvious thing to say is that (λp) is not a solution of the *whole* system. Precisely, since Say's Identity is satisfied by an infinite number of price vectors (p), it is that one which also satisfies the Cambridge equation that would be the solution of the system. (That is, assuming it has a solution, and assuming the Cambridge equation is tantamount to such an assumption. *Cf.* Hickman, *loc. cit.*, p. 16, on this point.)

It seems that discussion of this matter has sometimes lost sight of the necessary distinction between the independent and dependent variables in the system. Here k and M are independently given and the Cambridge equation determines the solution (p) of the system. However, if we preselect (p) we would be dealing with a different system wherein (p) are the independent variables and either k or M are dependent. In the latter case, if M is given, k cannot, of course, be interpreted as a given constant.

José Encarnación, Jr.

Princeton University.

A NOTE ON MR. GOULD'S DISCUSSION OF POTENTIAL SURPRISE [1]

Professor Shackle's fundamental criticisms of the type of decision theory which would be indicated by the orthodox theory of probability are two. Firstly, in unique actions the numerical probabilities of success or failure are irrelevant to the decision taken, and secondly, in any case there are many circumstances when these numerical probabilities are undiscoverable. No meaning is attached to any such concept as "subjective *a priori* probability." A large number of economic acts, particularly investment decisions, fall into the class covered by this second condition. However, in a strict interpretation of Professor Shackle's view a situation in

[1] My thanks are due to Mr. A. K. Sen, of Trinity College, Cambridge, for his helpful comments.

which the first condition alone held would be adequate to render the theory of probability inapplicable. If the probability of success of an act is irrelevant in the decision taker's mind, then it follows that increasing the probability of success does not affect the decision taker—that is, the compounding of probabilities is an irrelevant procedure in considering decision problems. Professor Shackle lays considerable emphasis on this point.

The discussion between Mr. Gould and Professor Shackle [1] consists of two parts. In the first part Mr. Gould produces an example where there seem strong reasons for rejecting the Shackle model. In the second part he discusses a formal description of the concept of potential surprise, which he holds to be a valid conception in certain circumstances—for instance, economic situations. After a preliminary discussion of Mr. Gould's example, the purpose of this note will be to point out one or two weaknesses in his formal discussion of the concept, and to emphasise that he only *discusses* the situation where the non-additivity of the measure of uncertainty prevails, but that this in itself does not give reasons for thinking that a system built on such a postulate is an applicable model.

Mr. Gould's counter-example, where he considers the Shackle model inapplicable, consists of a choice between two gambles A and B, which, described in orthodox probability terms, have outcomes as in the table:

Probability	1/36.	17/36.	17/36.	1/36.
A	−10	−1	9	20
B	− 9	−8	1	22

Units in £1,000.

A strict interpretation of Professor Shackle's system would indicate the choice of gamble B, as the highest possible gain is higher than that of A, while the lowest possible loss is not so great, and the outcomes as grouped in the table have equal potential surprise. It seems implausible that this choice would be made; the middle values, the occurrence of one of which carries a very high degree of probability as opposed to potential surprise, are substantially in favour of gamble A. This extreme situation is one in which the Shackle model begins to look very weak, and Mr. Gould is led to conclude that in gambling situations, where compounding of probabilities gives a large difference in the aggregate probability of success or failure, then the Shackle system breaks down. The problem becomes one of deciding how much the probability has to alter before it becomes significant in the decision taker's mind. Professor Shackle, in his comments, appears to agree that in some extreme cases his model must be abandoned.

Mr. Gould proceeds to give his more formal account of what the potential surprise concept with its characteristic of non-additivity entails in those

[1] "Odds, Possibility and Plausibility in Shackle's Theory of Decision: A Discussion," G. Gould and G. L. S. Shackle, ECONOMIC JOURNAL, December 1957.

situations where the second as well as the first condition holds; that is, where the probabilities are vague and undefined. The discussion reveals some of the difficulties which the strong assumption of the non-additivity of the measure of uncertainty raises, which render it at times intuitively difficult to accept.

Let us use the notation A s B to mean " The hypothesis A is more possible than the hypothesis B ", and A t B to mean " The hypothesis A is as possible as the hypothesis B." The system of four hypotheses A, B, C and D which Mr. Gould depicts can be represented by the relationships A s B, A s C, with D a " loose " hypothesis in that it cannot be placed in either an " s " or a " t " relationship with any of the other hypotheses. Mr. Gould brings in the further hypothesis E which is the composite hypothesis " B or C or D." No ordering relationship exists between the possibility of this hypothesis and that of the hypothesis A: that is, from the above conditions it cannot be deduced which of A s E, E s A and A t E obtains. However, Mr. Gould does specify the relationship E s D. In discussing the model he then goes on to assert the Shackle hypothesis: " In some situations . . . composite hypotheses (such as E) may carry no further weight than their individual components." Now this assertion does not follow at all from the previous argument. It is in fact contradicted earlier in the argument by the statement " E is more plausible than D." The contention that E carries no more weight than any of its constituent hypotheses taken individually implies the following three relationships: E t B, E t C and E t D, the last contradicting the previous assertion of E s D. However, even if the assertion of E s D is abandoned (and it can be, as no subsequent argument depends on it), then all that has been shown is that in this model the assertion of the equi-possibility of a composite hypothesis with a single one of its constituent hypotheses can be made without further contradiction, but no positive reason for its assertion is made. On these grounds, therefore, it can be claimed that this argument is a *non sequitur*.

I now wish to show that the introduction of the hypothesis D with unknown possibility is superfluous to the argument. In the model, A s B and A s C are specified. As these are simple ordering relationships, nothing can be said of the relationship of A with the composite hypothesis " B or C." Thus the incomparability of the composite hypothesis with the hypothesis A can be established without bringing D into the composite hypothesis. The second point at which D enters into the argument is when it appears as a constituent of the hypothesis E in the relations E t B, E t C and E t D. Now, however large or small is the possibility of the hypothesis D on its own, the composite hypothesis " B or C or D " cannot be *less* possible than the hypothesis " B or C ". Thus, as " B or C or D " t B (*i.e.*, E t B), then " B or C " t B without the intervention of hypothesis D (unless the composite hypothesis is regarded as being less likely than one of constituent members, which is hardly tenable). Thus the hypothesis D, the possibility of whose

occurrence is not placed in the ordering of possibilities, is irrelevant to the argument in that the points made with its assistance can equally well be made without.

Thus Mr. Gould's model does no more than assert that the composite hypothesis "B or C" may be no more possible than either of the individual hypotheses alone in situations where the probabilities of events happening are vague and unknown. It is tempting at this point to return to the firmer ground of probability theory and assert that this is only the case when the possibility of either A by itself or C by itself is so small as to be negligible. However, by firmly remembering our psychological rather than mathematical intent we might be induced to admit that sometimes "B or C" t B when the possibility of C alone is not negligible. The question becomes, "How great has the possibility of C to be before 'B or C' s B replaces 'B or C' t B?" Professor Shackle would hold that only in extreme cases would this happen (and I gather he regards Mr. Gould's first example as being such a case).

The question which is relevant in the discussion of models of decision taking (or in any economic models) is whether a model is applicable or not in the sense of its behaviour postulates being correct accounts of behaviour in the world. Hence the question to be asked of the Shackle model and the Gould interpretation of it is, "Is the assumption of the non-additivity of a measure of uncertainty a correct assumption about people's thought processes in the face of uncertainty?" The model holds as a logical system irrespective of its applicability but its interest is small if the range of problems where it is applicable is small. The postulate may be unacceptable in one situation but not in another. Mr. Gould gives an instance where the Shackle postulate does not seem to hold, but, as he himself makes quite clear, this does not necessarily mean that it does not hold in other and interesting situations. However, the non-additivity of the measure of uncertainty is a very strong assumption in all situations and contradicts what one is inclined to think intuitively about reactions to uncertain situations. Possibly it is applicable at times, but hesitation in accepting it without strong evidence is justified.

M. B. NICHOLSON

Trinity College,
Cambridge.

COMMENT ON ARROW AND THE "NEW WELFARE ECONOMICS" [1]

A RECENT paper in this JOURNAL by E. J. Mishan [2] defends the "new welfare economics" against what the author regards as criticism, and unjustified criticism, at the hands of Kenneth Arrow in his *Social Choice and Individual Values*.[3] His point is essentially that Arrow arrives at contradictions in the construction of social-welfare functions only be starting with propositions which have been denied, or at least not affirmed, by now standard welfare theory. In the light of this point the author seems to say:

(1) that Arrow has falsely criticised the new welfare economics;

(2) that it is impossible to construct a social-welfare function only if propositions unacceptable to the new welfare economics are admitted;

(3) that a social-welfare function can in fact be constructed on the basis of the new welfare economics.

I am persuaded that his points are not well taken, since he seems to misunderstand the concept of the "social welfare function" as it has generally been used by Bergson, Samuelson and others, and because he confuses the problem of constructing such a function with the other problems treated by welfare theory.

His criticisms, more specifically, rest on the point that Arrow has defined social alternatives as "indifferent" in two types of situation where they would not be so defined by the new welfare economics:

(1) two points on two Scitovsky community indifference curves each lying above the indifference curve passing through the other, the two curves intersecting at some point; and

(2) a choice between two situations x and y where xP_1y, but yP_2x, (where subscripts indicate different individuals).

The new welfare economics, the author says, would assert that two situations or alternatives were indifferent if, and only if, they were indifferent to all members of the community.[4] No attempt would be made to evaluate alternatives where genuine oppositions of interest between members of the community existed. But the type of analysis that must be here referred to is the analysis of the so-called "Paretian" conditions of optimality—the necessary (but not necessarily sufficient) conditions for a social maximum. It is true that in the context of this part of the welfare problem situations

[1] The Editors apologise for the omission of this note from the September issue. A rejoinder to it by Mr. Mishan was printed in that issue.

[2] E. J. Mishan, "An Investigation into some Alleged Contradictions in Welfare Economics," ECONOMIC JOURNAL, September 1957.

[3] London; Chapman & Hall, 1951.

[4] Mishan, *op. cit.*, p. 452.

defined by Arrow as "indifferent" are to be regarded, indeed, not as "indifferent" but as "incomparable." However, I find nothing in Arrow indicating disagreement with, or criticism of, this part of the new welfare economics.

The problem confronting the constructor of social-welfare functions is that, given tastes, technology and resources, there are an infinite number of optimal positions (depending upon income distribution) open to a society. The social-welfare function is an ordering of these optima, and the difficulty is precisely that a choice between optima involves conflicts of interest of a kind with which the new welfare economics does not and cannot deal. This point is made quite explicitly in Arrow's book.[1] Alternatives such as x and y, where xP_1y, but yP_2x cannot be regarded as "incomparable" in this part of the welfare problem because this part of the problem is just exactly the making of such comparisons.

The kind of social welfare function which can be constructed from the new welfare economics is defined only for alternatives on the ordering of which there is unanimity within the community, as Mishan states.[2] For this relatively simple problem the compensation principle is useful, since it rules out alternatives which can be improved upon from the point of view of every member of the community. This principle is of no use, however, in deciding between true alternatives, that is, between two or more maximal states. This is the problem with which Arrow is concerned, and it would seem quite proper for him to prove that the compensation principle is of no help to him.

RICHARD G. DAVIS

Princeton University.

A FURTHER NOTE ON FINANCE AND TAXATION IN JAMAICA

I

THE significance of economic and financial problems and the difficulties involved in making detailed analyses of social and economic conditions in underdeveloped economies have been indicated by Mr. D. J. Morgan in his appraisals of two official documents relating to the special problems of economic development in Jamaica and which were prepared by Professor and Mrs. Hicks and by Messrs. Towers and Fisher.[3] It is the principal

[1] Arrow, *op. cit.*, p. 37.

[2] Mishan, *op. cit.*, p. 454.

[3] The ECONOMIC JOURNAL, June 1957, pp. 347–53. In his further note on "West Indian Finances," which appeared in the December 1957 issue of the JOURNAL, Mr. Morgan mentioned the limits to policy in the British Caribbean which are set by factors such as "the relative poverty of the area, the almost total lack of interest in Government finance, the area's economic vulnerability and the dependent nature of the currency."

purpose of the present writing to review the broad issues involved in the formulation and administration of subsequent financial and taxation policy in the island economy.

Mr. Morgan stated that the long-awaited reform of the system of land valuation, taxation and rating in Jamaica had been deferred largely because of indecision as to the basis to be adopted. The recommendation of the Bloomberg Commission in 1943 that unimproved value should—instead of capital value—be the basis of land taxation and rating was accepted without comment in 1952 by the Mission of the International Bank for Reconstruction and Development.[1] Mr. Morgan suggested that the case for unimproved-value taxation had not been closely argued and that, in their 1955 Report, Professor and Mrs. Hicks effectively addressed themselves to the issue of its practicability in detail; he also noted, with regret, that their stated case against unimproved values had no great impact on public policy. The 1956 "Report on Jamaica"[2] stated that the Hickses "advised against the system of unimproved value taxation, and proposed a compromise solution which it was felt would allow the work of revaluation to proceed on the accustomed lines, using improved values as the basis for land taxation, but attempting to secure the benefits of unimproved values by a system of temporary deductions to be applied selectively in accordance with the Government's policy towards various types of improvements." The official reasons given for the rejection of those taxation proposals were that it was felt "that, subject to certain modifications, the application of the principles of unimproved land value taxation to Jamaica was feasible and desirable" and "that there was no real substance in the point made by Professor and Mrs. Hicks that a revaluation properly carried out on the improved value or any other basis would involve any less effort than a revaluation on the unimproved value basis."[3]

[1] In England much interest has centred around the problems of taxation and rating on unimproved or land values—a form of taxation which has been levied by Australasian Governments since 1884. (See, for example, A. C. Pigou, *A Study in Public Finance*, Chapter XIV (London: Macmillan, 1928). The 1952 Report of the Land Enquiry Committee provides a recent appraisal of special problems associated with the imposition of such a levy in a highly developed economy subject to comprehensive planning controls. (*The Rating of Site Values* (London: Her Majesty Stationery Office, 1952).)

[2] *Jamaica: Report for the Year 1956*, pp. 186–90. (London: Her Majesty's Stationery Office, 1957.)

[3] *Op. cit.* Mr. Morgan has subsequently indicated the completeness of the official acceptance in Jamaica of the principle of unimproved value and stated that the critique by Professor and Mrs. Hicks of the suitability and applicability of the principle to Jamaican conditions was the only one of which he had knowledge. Although he conceded that a general revaluation was necessary because of what he described as a complete change since the last revaluations in 1929 and 1937 in the economic situation in Jamaica "from depression to boom, from forced sales to speculative land deals," Mr. Morgan still thought that the implications of the changeover to unimproved value had not been understood in official circles. (See D. J. Morgan, "Land Valuation and Land Taxation in Jamaica," *Public Finance* (*Finances Publique*), Vol. XII, No. 3, pp. 232–9. Haarlem, Netherlands, 1957.)

II

In 1956 and 1957 the Government of Jamaica—with the co-operation of the United Nations Technical Assistance Administration—obtained the advice of Dr. J. F. N. Murray on the practicability of effecting the proposed changeover from capital to unimproved-value taxation and on the organisation and direction of the current programme of revaluation. Dr. Murray clarified the major issues and complexities of land valuation, taxation and rating in the Jamaican setting and formulated the working basis of the system, the principles of which are now being implemented under the administrative direction of Mr. J. M. Copes as Commissioner of Valuations to provide for land taxation and general rating to be levied upon unimproved values and, if so desired, for special or services rating to be based upon capital values.[1] The results of the current revaluation of Jamaica have confirmed the general appropriateness of unimproved value as the basis of taxation and rating, and the following summary of the analysis given in the Murray Report of the central points at issue in the Hicksian proposals may serve to illustrate the basic difficulties which underlie policy formulation involving complex problems in land economics unless such problems have come directly within the ambit of personal professional experience.[2]

The statement by Professor and Mrs. Hicks that, in unimproved-value rating, valuers would be forced to work on new and unfamiliar lines, is not correct in the case of rural lands because the data available are normally insufficient to enable capital values to be ascertained by capitalisation of net

[1] *Report to the Government of Jamaica on Valuation, Land Taxation and Rating*, by J. F. N. Murray (Kingston, Jamaica: The Government Printer, 1957. Pp. 55. 5s.). In the third edition of his *Principles and Practice of Valuation*, Dr. Murray demonstrated that the dissociation of valuation theory and general economics since the days of Sir William Petty, whom Karl Marx described as "the father of political economy and to some extent the founder of statistics," retarded the general development of these related disciplines. An inevitable consequence has been that the problems of land taxation have not been, in practice, one of the economist's most successful fields of research and of professional advising. See, for example, Herman Finer, *Road to Reaction*, p. 81 (London: Dennis Dobson Ltd., 1945) and *A Survey of Contemporary Economics*, Vol. II (ed. Bernard F. Haley), Essay on "Public Finance" by C. Lowell Harriss, pp. 294–5 (American Economic Association, 1952). Professor Finer referred to the "great errors" made by economists in respect of—*inter alia*—land-tax laws which have had "practical application in government and business policy"; Professor Harriss noted a further decline in academic interest in property taxation and observed that "no one draws on our wealth of sad experience with the administration of property (and death) taxes," although he considered the contribution of Professor and Mrs. Hicks and Dr. Rostas in *The Taxation of War Wealth* (Oxford, 1941) was probably the best discussion.

[2] During the last two decades, the processes of indirect induction or of abstract reasoning in economics without empirical verification have been subject to challenge, but I sometimes wonder if the distinguished economists and econometricians, including Professor Schumpeter, who have attempted some reappraisal of the relative position of Petty and political arithmetic and that of Smith and Ricardo, have realised that it can be shown that political arithmetic was, in essence, little more than contemporary valuation theory and practice applied to the solution of national problems. In Chapter 23 of his *General Theory*, Lord Keynes also acknowledged the contribution to statecraft made by the methods adopted by the early pioneers of economic thinking in the sixteenth and seventeenth centuries, but, surprisingly, made only incidental references to Petty's contributions.

rentals or profits; in such cases, the process of valuation must obviously consist of the summation of the values of land, qua land, and the improvements upon it. It is also standard valuation practice to check the values of urban areas obtained by capitalisation against both the land value and the value of the improvements. Professor and Mrs. Hicks further stated, although they did not support their argument, that the separation of land and building values is very much easier in a country where buildings are frequently pulled down and rebuilt. That state of affairs is realistic only when the buildings are new and develop sites to the optimum extent and the values of buildings equal their current costs of construction. In any event, it is not necessary to demolish improvements to ascertain site values.

It is also of interest to consider the Hickses' discussions of the development element in capital value which, they stated, was " hard to catch," and the de-rating of certain types of improvements for a period of years. The valuation process does not, however, involve forecasting market trends and is directed objectively towards the interpretation of evidence drawn only from sales of comparable properties. In the absence of such sales, an official marking up of values in the vicinity of a new cinema or grocery store in the Hicksian sense would merely be simple prophecy. It is further suggested that their proposals for de-rating concessions would, if effective in certain circumstances, simply create " unfair " competition between similar types of businesses and that their probable effects would include a rise in values and prices of vacant or poorly developed sites.

The incidence of capital value taxation, *cet. par.*, falls mainly upon large and highly improved properties because poundages are fixed in relation to revenue requirements and to the *aggregate assessed* capital value of all subject properties. It is, nevertheless, assumed by Professor and Mrs. Hicks that, because assessments on the basis of capital values include the speculative element in land value, a rate or tax on capital value brings in its train development similar to that engendered by a levy upon unimproved value. Australian—as well as Jamaican—experience, on the other hand, has shown that the impact and incidence of capital-value taxation—*per se*—tend generally to inhibit the development of real estate, to encourage speculation in land and to benefit those who, for speculative reasons, withhold it from its highest and best use. In the history of England there are actual instances, as in the case of the 1656 " Act for preventing the Multiplicity of Buildings in and about the suburbs of London," when levies were imposed " disproportionately " on improved properties with the express intention of discouraging new building and of restricting city growth.

III

It has become clear that an immediate and vital effect of the adoption of unimproved values for rating and taxation purposes would be to shift the incidence of rates and land taxes in Jamaica from small and impoverished

rural holdings with habitations to vacant urban allotments and suburban lands which are becoming ripe for development.[1] From this it follows that, as enterprising owners will not be taxed on the results of their personal labours, improvements to all classes of holdings would not be discouraged even by higher levels of taxation in specific instances. In other circumstances—such as when the value of improvements is much greater than the unimproved value, including those of luxury hotels and residences—it is important, when sufficient sales data are not immediately available, to ascertain whether the incidence of levies based solely upon unimproved values is entirely equitable, as such properties could become virtually de-rated. Sales analyses made during the progress of the current revaluation of Jamaica have now revealed that the prices paid for sites for hotels and luxury homes ensure that their unimproved values will constitute an equitable basis for taxation and rating.

Mr. Morgan, however, referred to the recent Land Valuation Law and the partial combination of unimproved and capital values as the basis of rating and taxation as a "regrettable compromise greatly inferior to the alternative" suggested in the Hicks Report. The combination of land taxation and general rating levied upon unimproved values and of special or services rating based upon capital values is being introduced to ensure —*inter alia*—that highly improved properties in service areas make a contribution to public revenues in proportion to services received. In other words, the objects of the dual system in Jamaica are to provide the advantages of reducing existing anomalies in the cases of special buildings and of introducing flexibility of administration during the transitional period when the island is being valued parish by parish and also after the completion of the valuation of the whole island. That revaluation, which is tantamount to a national stocktaking, is now proceeding in accordance with the policy recommendations of the Murray Report and is directed towards ascertaining capital values in service areas and the unimproved value of every parcel of land in Jamaica.

D. F. MURRAY

Canberra,
Australia.

[1] Taxable capacity in Jamaica, of course, is limited, and the capital-value system caused general dissatisfaction; the assessed values, admittedly, were low, but, as an expedient, land tax was imposed at progressive rates, with increases in tax liability extending back over the whole of each range of taxable values. It is essential to any appreciation of the valuation problem in the island to note that a great part of its terrain is extremely steep and that the demand for land under existing conditions of population growth and economic absorptive capacity led, over the years, to the cultivation and utilisation of slopes which, elsewhere, would be regarded as precipitous and too liable to erosion for effective and continued development. The general level of poverty in the Jamaican economy is also illustrated by the classification of farms according to area given in the 1952 *Report of Mission of the I.B.R.D.*; only 68,000 out of the total of 319,000 separate holdings exceeded one acre in area. Standards of living and of building construction in the hills are such that it has been authoritatively suggested to me that it is possible for a Jamaican peasant or smallholder to live on his "garden truck" and a very small cash income. An attempt to elucidate the interplay of causes and effects of emigration from Jamaica is, however, beyond the scope of present writing.

CURRENT TOPICS

MAY we offer our most sincere congratulations and good wishes to Lady Wootton as one of the first four women to be given the honour of a Life-Peerage? While much of Lady Wootton's recent work has lain within the kindred discipline of sociology, we are proud to remember that she was by earlier training an economist and that she has made distinguished contributions to our own discipline as well as to that of social theory.

WE are pleased to be able to announce that the economic library of the late Professor Hollander has been acquired by the University of Illinois and that, as Professor J. F. Bell informs us, it will at long last be open to scholars. This is most welcome news, for since the death of its owner in 1940 the library had been stored away in boxes and completely inaccessible. Its contents, however, are known from the excellent catalogue that was issed in a limited edition in 1937. Although Hollander may not have had the means of Seligman or the flair of Foxwell, yet he was an early gatherer in the field at a time of unlimited opportunities. Among the manuscripts in the library are letters of Adam Smith, which were published by W. R. Scott, and a few of Ricardo, which Hollander intended to use himself in the *opus* which he has left unfinished; these it is hoped to include among the addenda in the Index volume of the Works of Ricardo.

Houblon-Norman Awards. The Trustees of the Houblon-Norman Fund invite applications for Fellowships or Grants in Aid of Research into the working industry and finance in Great Britain and elsewhere and the economic conditions affecting them. Fellowships are intended primarily for established scholars who require leave from teaching or other duties to complete work on which they are engaged, or for other senior research workers with similar qualifications. Fellowships are therefore awarded only for full-time work; but this does not necessarily preclude some extraneous work, subject to the consent of the Trustees. Fellowships are normally granted for one year, which may be renewed for a second year. They may be supplemented by an allowance for travelling and other incidental expenses. In addition Grants are made to others who are not eligible for Fellowships to assist approved research, whether part-time or full-time. While such grants will normally be limited to expenses, the grant of a subsistence allowance will also in exceptional cases be considered. The amount of the award, which will take effect from October 1, 1959, will be such as may appear necessary to the Trustees to enable the candidate to undertake the work. Candidates must be British subjects normally resident in the

United Kingdom. Forms of application, which may be obtained from the Secretary of the Fund, c/o the Bank of England, London, E.C.2, should be returned not later than March 1.

THE International Economic Association held its Annual Conference during September 1958 on the island of Corfu. The subject chosen for it was Capital Theory. Among those who contributed papers were F. Lutz (Switzerland); J. Hicks, D. Champernowne, N. Kaldor, T. Barna (United Kingdom); P. Samuelson, W. Fellner, R. Goldsmith, E. Domar, R. Solow (United States); W. Hoffmann (W. Germany); J. Marchal, A. Barrère (France); B. Thalberg (Norway). Among some dozen other participants were E. Lindahl (President), G. Haberler (Hon. President), A. Robinson (Treasurer) and P. Sraffa and I. Little (United Kingdom). The papers and a summary of the vigorous and hard-hitting discussions will be published for the International Economic Association by Messrs Macmillan.

THE following have been admitted to Life Fellowship of the Society:

Baerncopf, Prof. D. A.	Hoare, D. T.	Sen, Amartya Kumar
Cooper, G. A.	Khan, M. I.	Shah, Anil C.
El Serafy, Dr. S. E. D.	Pasinetti, L. L.	Von Boventer, Dr. E.
Gupta, K. L.	Schloss, Prof. H. H.	

THE following have been admitted to Fellowship of the Society:

Adepeju, A. A.	Crossley, J. R.	Glenn Campbell, W.
Awopeju, J. O.	Cruikshank, R. J.	Goh, Sieow Wah.
Baksh, H.	Dalal, Miss U.	Gonsalves, C.
Bateman, D. I.	Dayapara Murthy, P.C.	Gould, J. R.
Batten, H. A.	Dowling, J.	Haddad, L.
Bhalsod, D. K.	Duncan, W. J.	Hall, F. L.
Blair, A. J.	Echevarria, Prof. O. A.	Harcourt, G. C.
Bober, S.	Edmondson, G. R.	Herrick, W. P.
Bradley, J. J.	Evans, R. A.	Hoegh-Guldberg, H.
Brookes, G. M.	Ewelukwa, D. I. O.	Howard, L. M.
Chaudhuri, S. K.	Fahm, L. A.	Iro, M. I.
Christodoulou, E. N.	Falkingham, R. P.	Jacobson, I. J.
Clement, Prof. M. O.	Ferguson, Prof. C. E.	Johnson, S. K.
Conde, R.	Fisher, R. G.	Johnston, Prof. J.
Connolly, J. G. P.	Gaebler, F. S.	Jucker-Fleetwood, E. E.
Crawford, S.	Gandy, A. V. H.	Karkaria, D. D.
Crickmore, J. B.	Garg, M. L.	Knox, J. R.
Croll, J. R.	Gibb, M. M.	Langley, L. A.

Lawrie, J. W.
Lee Man Yuk
Lessing, H. W.
Levine, N.
Liebowitz, H. A.
Long, P. M.
Mago, R. C.
Malet, Dr. D.
Mansfield, L. C. S.
Markwell, P.
Massell, B. F.
McCasker, A. W.
McGuinnes, P.
McLaughlin, J.
McNamara, B.
Mitchell, W.
Moore, C. H.
Morrin, F. D.
Mukherjee, N.
Nair, S. A. B.
Neeves, L. D.
Okere, L. V. N.
Osanyinjobi, F.
Pai, K. J.
Parikh, Dr. G. M.
Parker, D. L.
Patel, C. A.
Ramanathan, K. C.
Riley, J. F.
Salama, E.
Saridja, O.
de Silva, D. P. N.
Singh, R. P.
Sirisena, U. D. I.
Sly, D. F.
Thakkar, L. V.
Townsend, P. A. R.
Vanden Berghe, R.
Wallich, Prof. H. C.
West, Miss T.
Yentumi-Mensah, J.
Zaracostas, C.

THE following have been admitted to Library Membership of the Society:

Economic Institute of Africa, Bulawayo.
Faculdade de Ciencas Economicas, University of Bahai, Brazil.
Forest Hill Research Station, Farnham, Surrey.
Gobardanga Hindu College, West Bengal, India.
Institut des Hautes Etudes Arabes, Cairo, Egypt.
Long Island University, Brooklyn, New York.
National Planning Board, Government of Pakistan, Karachi.
National Research Council, Ottawa, Canada.
Santa Monica State College, California, U.S.A.
State Finance Committee, Hobart, Tasmania.
University of Nevada, Reno, U.S.A.

THE Annual Meeting of the Royal Economic Society will be held on Thursday, July 9th, at 5.0 p.m., at the London School of Economics.

RECENT PERIODICALS AND NEW BOOKS

Journal of the Royal Statistical Society

VOL. 121, PART 2, 1958. *Classification of the Population by Social and Economic Characteristics: The French Experience and International Recommendations:* M. BRICHLER. *Research in Statistics:* M. G. KENDALL. *Differential Prices for the Services of Ships Belonging to the Same General Class: A Case of Oligopoly:* D. E. KOPANITSAS. *The Efficiency of Randomization by Card Shuffling:* D. D. KOSAMBI and U. V. R. RAO.

VOL. 121, PART 3, 1958. *Industrial Production and Steel Consumption:* SIR R. SHONE and H. R. FISHER. *Some Problems in the Measurement of Price Changes with Special Reference to the Cost of Living:* S. J. PRAIS. *The Design of a Long-term Sampling Programme to Measure the Hazard Associated with an Industrial Environment:* J. R. ASHFORD. *Wholesale Prices in 1957.*

Applied Statistics

VOL. VII, NO. 2, JUNE 1958. *The Economist and his Statistics:* E. SHANKLEMAN. *Simple Mortality Rates:* S. BROADBENT. *Marginal Cost:* A. MUIR. *A Simple Approach to the Minimisation of Store-size:* N. T. J. BAILEY. *Factor Analysis:* G. H. JOWETT.

Economica

VOL. XXV, NO. 99, AUGUST 1958. *On the Theory of Oligopoly:* W. J. BAUMOL. *Productivity-geared Wage Policies:* K. LANCASTER. *Wages Policy in Sweden:* T. L. JOHNSON. *Bank of England Branch Discounting, 1826–59:* R. O. ROBERTS. *Uncertainty, Probability and Potential Surprise:* L. FOLDES.

The Review of Economic Studies

VOL. XXV, NO. 68, JUNE 1958. *Tariffs, Retaliation and the Elasticity of Demand for Imports:* W. M. GORMAN. *The Wicksell Effect:* E. OSBORN. *Utility and the "Ordinalist Fallacy":* W. E. ARMSTRONG. *The Predictive Accuracy of the Marginal Productivity of Wages:* J. L. STEIN. *The Relation between the Accelerator and the Capital Output Ratio:* A. E. OTT. *Demand Theory without a Utility Index: A Comment:* P. K. NEWMAN and R. C. READ; *Further Comments:* L. MCKENZIE. *Immiserizing Growth: A Geometrical Note:* J. BHAGWATI. *Risk Bearing and Income Taxation:* N. KALDOR.

Yorkshire Bulletin of Economic and Social Research

VOL. 10, NO. 1, JUNE 1958. *On Measuring Utility:* A. GABOR and S. F. JAMES. *Matrix Multiplier Analysis: An Exposition:* A. HAGGER. *Mrs. Robinson's Warranted Rate of Growth:* J. D. SARGAN. *The Savings–Investment Equations in Post-war Britain:* H. BURTON. *Index Numbers on Liner Freight Rates in United Kingdom Trades 1946–57:* D. L. MCLACHLAN.

International Affairs

VOL. 34, NO. 4, OCTOBER 1958. *Nuclear Weapons and Defence: Comments on Kissenger, Kennan, and King-Hall:* P. M. S. BLACKETT. *Storm Clouds over the Horn of Africa:* B. BRAINE. *World Recession and the United States:* R. F. HARROD. *Indonesia and the Commonwealth in South-East Asia: A Re-Appraisal:* C. D. COWAN. *Disengagement and Western Security:* M. HOWARD. *The German Resistance in its International Aspects:* H. ROTHFELS.

The British Journal of Sociology

VOL. IX, NO. 3, SEPTEMBER 1958. *Social Change:* M. GINSBERG. *Kinship in Anglo-Saxon Society: I:* L. LANCASTER. *Some Present Trends of Social Anthropology in France:* E. M. MENDELSON. *Employment of Sociology and Anthropology Graduates: Final Report:* J. A. BANKS.

Soviet Studies

VOL. X, NO. 1, JULY 1958. *The Origin and Status of the Cheka:* E. H. CARR. *The Soviet Union as a Neutral, 1939–41:* G. GINSBURGS. *Soviet Economic Relations with the Underdeveloped Countries:* N. B. SCOTT.

Journal of Agricultural Economics

VOL. XIII, NO. 1, JUNE 1958. *Rigidities in Milk Production:* I. G. REID. *The Small Farmer:* E. M. CARPENTER. *My Impressions of Russian Agriculture:* W. E. CAVE. *The Relevance of the Theory of Tariffs to Agricultural Production:* G. MCCRONE. *Planting Density and the Economics of Late Flowering Chrysanthemum Production:* A. B. WEBSTER. *Estimating a Supply Curve:* F. HOLME. *Economies of Scale in Farming:* J. R. RAEBURN.

The Farm Economist

VOL. IX, NO. 1, 1958. *The Distribution of Manpower in Agriculture and Industry, 1851–1951:* J. R. BELLERBY. *The Economy of Feed Input in Milk Production:* F. J. ORTON. *Research Methodology and Peasant Agriculture:* E. S. CLAYTON and A. MARTIN. *Capital in Agriculture:* C. CLARK.

The Agricultural History Review

VOL. VI, PART II, 1958. *Agriculture in Roman Britain:* S. APPLEBAUM. *The East Anglian Foldcourse: Some Queries:* A. SIMPSON. *The Lost Village and the Landscape of the Yorkshire Wolds:* A. HARRIS.

British Tax Review

SEPTEMBER 1958. *The Finance Act, 1958:* G. S. A. WHEATCROFT. *A Tale of Two Pennies:* W. PHILLIPS. *The Variation of Trusts Act, 1958:* J. A. BRIGHTMAN. *The Opening Years' Provisions: Uses and Abuses:* A. W. NELSON. *Income Tax on Profits from Sand and Gravel:* J. P. LAWTON. *The Settlement Provisions of the Finance Act, 1958:* J. G. MONROE. *Double Taxation Relief on Trust Income:* F. E. KOCH. *Tax Paid:* J. H. BURTON. *Tax and the Administration of Estates:* F. W. HENWOOD. *Back Duty: I—The Liability to Penalties:* J. M. BROWN.

Journal of the Institute of Actuaries

VOL. 84, PART I, NO. 366, 1958. *The Application of Elementary Linear Programming to Approximate Valuation:* S. BENJAMIN and C. W. BENNETT. *Insurance Contracts in terms of Equity Shares:* A. C. EDWARDS. *Variations in the Sex Ratio at Birth:* P. G. MOORE.

The Banker

VOL. 108, NO. 391, AUGUST 1958. *Middle East and Reflation. The New Monetary Weapon. Capacity for Re-Expansion:* J. E. HARTSHORN. *Company Finances after the Boom:* S. J. PRAIS. *Ulster's Unemployment Problem:* P. ROBSON.

VOL. 108, NO. 392, SEPTEMBER 1958. *Brendan Bracken:* LORD MONCKTON. *The Banks in Hire Purchase. The Suspect Dollar. European Free Trade—The Great Divide:* W. RÖPKE. *What Future for Pension Schemes? The Hire Purchase Structure.*

VOL. 108, NO. 393, OCTOBER 1958. *From Montreal to New Delhi. Consumer Banking. Galbraith Rides Again:* J. E. HARTSHORN. *Lending Germany's Surplus:* R. E. LUKE. *India's Breathing Space:* G. TYSON. *Deflation Through Wool:* H. W. ARNDT. *Brazil's "Fifty Years in Five."*

The Bankers' Magazine

VOL. CLXXXVI, NO. 1373, AUGUST 1958. *The End or Suspension of the Credit Squeeze? New Credit Measures and the Balance of Payments:* SIR R. HAWTREY. *Background to Expansion:* T. C. MAYNARD. *The Banking Half-year. Survey of Economic Conditions in the U.S.A.: Consolidation of Recent Gains. Central Banking in Nigeria:* A. HAZLEWOOD.

VOL. CLXXXVI, NO. 1374, SEPTEMBER 1958. *Bank Rate and the Recession. Banking Links with H.P. Finance. Banking Systems of the Future:* R. HINDLE. *Some Comparisons between Banking in the U.S.A. and the U.K.:* H. W. AUBURN. *Banking Comparisons in the U.S. and U.K.:* SIR R. HAWTREY. *American Imports, 1956–58:* F. G. DAVIDSON. *Survey of Economic Conditions in the U.S.A.: The Dow–Jones Average Breaks Through 500.*

VOL. CLXXXVI, NO. 1375, OCTOBER 1958. *Medium-term Finance for Exports:* N. MOMTCHILOFF. *The City's Invisible Earnings:* A. VICE. *Personal Loan Services. Survey of Economic Conditions in the U.S.A.: Disagreements within the Federal Reserve System. Swiss Bank Secrecy X-rayed:* G. H. MORISON.

District Bank Review

NO. 127, SEPTEMBER 1958. *The Cotton Industry in Contraction:* SIR R. STREAT. *Peculiarities of the American Recession:* B. THOMAS. *Taking Stock.*

Lloyds Bank Review

No. 50, OCTOBER 1958. *The Fund and the Future:* M. STAMP. *The Changing Oil Situation:* D. BURN. *Forward Exchange: The Case for Intervention:* A. E. JASAY.

Midland Bank Review

AUGUST 1958. *Our Post-war Half-century. Where are the Unemployed?—A Survey of Uneven Distribution. Basic Services: Works, Housing, Research.*

The National Overseas and Grindlays Review

VOL. 4, NO. 3, JULY 1958. *Draft Agenda for Montreal. India's Mounting Foreign Exchange Difficulties. Trade in Two Territories: Short Reports on Uganda and Zanzibar.*

The Three Banks Review

No. 39, SEPTEMBER 1958. *The Economic Gains from Freer Trade with Europe:* H. G. JOHNSON. *Local Unemployment:* J. SYKES. *The Bank of England—Agent of the Royal Bank of Scotland.*

Planning

VOL. XXIV, NO. 426, SEPTEMBER 1958. *Problems of World Liquidity.*

Town and Country Planning

VOL. XXVI, No. 9, SEPTEMBER 1958. *Chaos of London Markets:* G. ALLEN. *Housing in Hungary:* R. P. HELLER. *The Example of Zurich:* R. ELVIN.

Which?

VOL. 1, NO. 4, SUMMER 1958. *Reports on Washing Machines, Cut Price Groceries, Sunburn and Suntan Preparations, Skin Tonics, Ball Point Pens.*

Progress (Lever Bros.)

VOL. 46, NO. 259, SUMMER 1958. *Fifty Years of Change:* LORD ATTLEE. *Europort—The Gateway of Europe;* K. P. van der MANDELE. *The Colonial Development Corporation:* SIR H. BEAVER. *The British Association:* P. M. S. BLACKETT. *Village Community Development in India:* R. TOULMIN. *A Display of Character:* M. BLACK. *Technical Education in East and Central Africa:* A. ALBU.

The Journal of the Institute of Transport

VOL. 27, NO. 11, JULY 1958. *The Operation of Tramp Shipping:* C. F. B. ARTHUR. *The Change-over to Diesel Traction on Irish Railways:* T. C. COURTNEY. *The Organisation of Transport:* SIR B. ROBERTSON. *Railway Management:* E. W. ARKLE. *Southern Africa Visit:* SIR R. WILSON.

VOL. 27, NO. 12, SEPTEMBER 1958. *Road Haulage in North America:* G. W. QUICK SMITH. *Air Ferry Integration with Surface Transport for the Carriage of Passengers:* J. R. HAWKES. *Traffic Inspection in Road Passenger Transport:* M. ROURKE.

Hard Fibres

No. 30, SEPTEMBER 1958. *World Situation. Output Trends 1958. The Problem of Prices.*

The Economic Record

VOL. XXXIV, NO. 68, AUGUST 1958. *The Australian Economy, July 1958:* D. COCHRANE. *Australia and European Free Trade:* W. M. CORDEN. *Trade and Redistribution of Income—Is There Still an Australian Case?:* A. J. RIETSMA. *Economic Experiments in New Zealand and Their Political Background:* K. A. BLAKEY. *The Growth of the Cement Industry in the 1920s: A Study in Competition:* C. FORSTER. *The Pattern of Australian Demand:* C. E. V. LESER. *Capital, Income and Output in New Zealand Agriculture, 1922–1956:* B. D. PHILPOTT and J. D. STEWART. *Another Look at the Acceleration Relationship and Equilibrium Growth:* R. HIESER.

The South African Journal of Economics

VOL. 26, NO. 2, JUNE 1958. *Mrs. Robinson on the Accumulation of Capital:* L. M. LACHMANN. *Verdere Opmerkings in Verband met Inflasiebestryding in Wes-Europa:* D. G. FRANZSEN. *African Trade Unionism in the Copperbelt of Northern Rhodesia:* P. K. LOMAS. *The Structure of the Cotton Textile Industry in South Africa:* C. BAK. *Some Aspects of South Africa's Foreign Trade in Relation to her Aggregate Income 1910–54:* I. R. WOODS.

The Indian Economic Journal

VOL. V, NO. 4, APRIL 1958. *The Indian Economic Scene—Some Aspects:* B. R. SHENOY. *On Rephasing the Second Five Year Plan:* D. R. GADGIL. *Why Do We Disagree on Investment Policies for Development?:* H. LEIBENSTEIN. *International Investment and Economic Development:* M. SINGH. *An Assessment of Mr. Deshmukh's Economic Role:* I. S. GULATI.

VOL. VI, NO. 1, JULY 1958. *A Re-evaluation of the Scarcity Postulate in the Light of Recent Theoretical Developments in the Social Sciences:* M. E. POLAKOFF. *Taxation in a Developing Economy with Special Reference to the Indian Plans:* M. H. GOPAL. *Contemporary Trends in European Co-operative Banking:* K. V. SRI RAM. *On the Relevance of the Sectoral Concept in the Theory of Economic Development:* J. K. SENGUPTA. *Professor Gadgil on Rephasing the Plan: A Reply:* B. R. SHENOY. *Plurality as Underdevelopment:* R. K. HAZARI. *Locational Industrial Matrix in Economic Planning:* S. S. WAGLE.

The Indian Economic Review

VOL. IV, NO. 1, FEBRUARY 1958. *A Growth Equation Analysis of the Ricardian and Marxian Theories of Growth:* W. O. THWEATT. *Léon Walras:* H. K. MANMOHAN SINGH. *Investment and Efficiency in Indian Railways during the Second Five Year Plan:* S. J. PATEL. *The Indian Labour Market and its Impact on the Pattern of Regional Wage Differentials:* H. LAXMI NARAYAN. *A Method for Estimating Decade Internal Migration in Cities from Indian Census Data:* S. N. AGARWALA.

Sankhyā

VOL. 19, PARTS 3–4, JUNE 1958. *Bengal Anthropometric Survey, 1945: A Statistical Study:* D. N. MAJUMDAR and C. R. RAO.

Arthaniti

VOL. I, NO. 2, MAY 1958. *Factor Proportions, Comparative Advantage and Factor Prices:* S. MUKHERJEE. *The Ricardian Theory of Distribution Reconsidered:* M. K. RAKSHIT. *A Note on the Mahalanobis Model of Sectoral Planning:* A. SEN. *Investment Allocations and Balanced Growth:* A. RUDRA. *Investment Criterion Problem:* B. DATTA. *Food, Population and Policy:* R. DATTA.

Tata Quarterly

VOL. XIII, NO. 2, APRIL 1958. *Investment of Life Insurance Funds. Economic and Financial Review, January–March 1958.*

VOL. XIII, NO. 3, JULY 1958. *Special Institutions for Financing Industry. Economic and Financial Review, April–June 1958.*

Population Review

VOL. 2, NO. 2, JULY 1958. *Population and Human Fulfilment:* SIR J. HUXLEY. *China's Population:* I. B. TAEUBER. *Population Trends and Labour Force in India, 1951–66:* T. CHELLASWAMI. *Population Planning in China:* S. CHANDRA SARKER. *The Composition of India's Population: II:* S. CHANDRASEKHAR.

Pakistan Economic Journal

VOL. VII, NO. 2, DECEMBER 1957. *The Optimum Choice of Technology:* J. TINBERGEN. *Criteria for Investment in Industrial Development:* C. WILCOX. *National Accounting Technique and Input–Output Analysis:* R. K. KHANDKER. *A Note on Secular Stagnation and Income Redistribution in Developed Economies:* Q. H. QURAISHI. *Principles of Central Banking:* M. RASHID. *Inflation and Capital Formation:* M. AKHLAQUR RAHMAN. *Policy Implications of the Measurement of International Trade Elasticities:* ZUBAIDA AZIZ.

The East African Economics Review

VOL. 4, NO. 2, JANUARY 1958. *Interest Rates in Conditions of Inflation and High Taxation:* P. J. GILL. *Africans and Income Tax in Uganda:* D. WALKER. *The Future of the Timber Industry in Kenya:* F. T. HENSON. *Some Comments on the Report of the Social Security Committee:* G. ST. L. D'ADHEMAR. *Power in Uganda:* D. WALKER.

The Irish Banking Review

MARCH 1958. *The Sterling Area and Ireland. The Agricultural Institute. The Psychological Elements in Federal Reserve Policies: Problems of Application:* C. R. WHITTLESEY.
JUNE 1958. *Foreign Capital in Irish Industry. The Budget and the National Economy. The Post-war West German Economy:* H. STRATHUS.

International Labour Review

VOL. LXXVIII, NO. 3, SEPTEMBER 1958. *The Forty-second Session of the International Labour Conference, Geneva, June 1958. Gradual Extension of Social Insurance Schemes in Latin American Countries. Pilot Survey of Family Budgets in Egypt:* H. M. HUSSEIN.

International Financial Statistics

VOL. XI, NO. 8, AUGUST 1958. Usual statistical material.
VOL. XI, NO. 9, SEPTEMBER 1958. Usual statistical material.

United Nations Economic Bulletin for Europe

VOL. 10, NO. 2, 1958. *Current Economic Developments in Europe. Recent Developments in Trade between Western and Eastern European Countries.*

Revue de l'Institut International de Statistique

VOL. 25, NO. 1/3, 1957. *La Trentième Session de l'Institut International de Statistique:* G. DARMOIS and R. C. GEARY. *"Inductive Behaviour" as a Basic Concept of Philosophy of Science:* J. NEYMAN. *Les tableaux de corrélation et les programmes linéaires:* M. FRÉCHET. *Specification Errors and the Estimation of Economic Relationship:* H. THEIL. *Maximum Likelihood Estimators with Heteroscedastic Errors:* G. R. FISHER.

Productivity Measurement Review

NO. 12, FEBRUARY 1958. *A Case History in Financial and Operating Ratio Analysis:* C. B. TAYLOR. *Productivity Increases in European Firms—Two Case Studies. Machine Interference:* W. KNÔDEL. *Productivity and Size of Firm:* K. BORCH. *Wages and Labour Productivity:* O. D. K. NORBYE.
NO. 13, MAY 1958. *Productivity Studies and Comparisons in Arc Welding:* A. G. THOMPSON. *German Studies of Productivity in Wholesale and Retail Trade:* F. KLEIN. *Interchange of Information between Business Enterprises:* W. MITCHELL. *Comparison for Comparison's Sake:* H. G. C. NANNINGA. *Productivity Measurement in the Nationalised Industries in Austria. Productivity and Size of Establishment in New Zealand Manufacturing:* J. W. ROWE.

Kyklos

VOL. XI, NO. 3, 1958. *William E. Rappard (1883–1958):* L. BAUDIN. *Auf der Suche nach dem Standort der Zeit: Alfred Weber zum Gedächtnis:* E. SALIN. *Professor Shackle on Economic Methodology:* J. AKERMAN. *Toward Comparative Historiography: Background and Problems:* F. REDLICH. *The Theory of Social Classes:* F. ZWEIG. *The Dollar and International Liquidity Problem Reconsidered:* R. TRIFFIN. *Price, Cost and Output:* H. R. EDWARDS. *Die Dogmengeschichte der Volkswirtschaftslehre im Lichte des Pragmatismus:* W. STARK.

The American Economic Review

VOL. XLVIII, NO. 4, SEPTEMBER 1958. *Soviet and American Inventory–Output Ratios:* R. W. CAMPBELL. *The Firm in Illyria: Market Syndicalism:* B. WARD. *Progressive Taxation in an Inflationary Economy:* E. J. MISHAN and L. A. DICKS-MIREAUX. *The Size Distribution of Business Firms:* H. A. SIMON and C. P. BONINI. *The Constancy of Relative Shares:* R. M. SOLOW. *Economic Problems in Air Force Logistics:* H. MENDERSHAUSEN.

The Annals of the American Academy of Political and Social Science

VOL. 318, JULY 1958. *Asia and Future World Leadership.*
VOL. 319, SEPTEMBER 1958. *Unofficial Government: Pressure Groups and Lobbies.*

The Quarterly Journal of Economics

VOL. LXXII, NO. 3, AUGUST 1958. *The Extremities of Current Agricultural Policy Proposals:* J. D. BLACK. *The Rate of Interest in a Dynamic Model:* A. LL. WRIGHT. *The Anatomy of Market Failure:* F. M. BATOR. *A Critique of Concepts of Workable Competition:* S. H. SOSNICK. *Economic Structure and the Regulation of Television:* H. J. LEVIN.

The Journal of Political Economy

VOL. LXVI, No. 3, JUNE 1958. *How Income Ought to be Distributed: A Paradox in Distribution Ethics:* R. H. STROTZ. *Liquidity and Farm Investment Outlays:* N. V. BRECKNER. *New Developments on the Oligopoly Front:* F. MODIGLIANI. *Futures Trading and the Storage of Cotton and Wheat:* L. G. TELSER.

VOL. LXVI, No. 4, AUGUST 1958. *Investment in Human Capital and Personal Income Distribution:* J. MINCER. *The Demand for Currency Relative to the Total Money Supply:* P. CAGAN. *On the Theory of Optimal Investment Decision:* J. HIRSHLEIFER.

The Review of Economics and Statistics

VOL. XL, No. 3, AUGUST 1958. *Economics and Operations Research—A Symposium: Operations Research and Economics:* W. W. COOPER; *Economics and Military Operations Research:* C. HITCH; *Marginalism and the Demand for Cash in Light of Operations Research Experience:* W. J. BAUMOL; *Economics, Management Science, and Operations Research:* M. SHUBIK; *Comment:* T. C. SCHELLING; *Marginal versus Algorithmism:* S. VALAVANIS; *Final Comment:* D. ELLSBERG. *An Economist Looks at Air Force Logistics:* S. ENKE. *A New Approach to the Construction of Index Numbers:* I. ADELMAN. *Criteria for Aggregation in Input–Output Analysis:* W. D. FISHER. *A Note on Private Saving:* E. F. DENISON. *The Statistical Conditions for a Change in Business Concentrations:* S. J. PRAIS. *The Demand for New Automobiles in the United States 1929–1956:* D. B. SUITS. *International Trade:* J. H. RICHTER; H. STAEHLE. *Generalizing the Balanced Budget Multiplier:* M. H. PESTON; W. A. SALANT.

The Southern Economic Journal

VOL. XXV, No. 1, JULY 1958. *On the Existence and Role of Money in a Stationary System:* R. E. KUENNE. *An Essay on Cardinal Utility:* C. E. FERGUSON. *Interregional Comparisons and the Marginal Product of Capital:* J. L. STEIN. *Some Factors Affecting Business Financing:* W. J. FRAZER. *Flood Control and the Tennessee Valley Authority:* J. E. HIBDEN. *An Analysis of Foreign Aid Administration in Korea:* L. de ALESSI. *Ten Years of GATT:* H. H. LIEBHAFSKY.

Journal of the American Statistical Association

VOL. 53, No. 283, SEPTEMBER 1958. *Influence of the Interviewer on the Accuracy of Survey Results:* R. H. HANSON and E. S. MARKS. *Demand for Farm Products at Retail and the Farm Level: Some Empirical Measurements and Related Problems:* R. F. DALY. *Investment Estimates of Underdeveloped Countries: An Appraisal:* W. I. ABRAHAM. *Manufacturer's Inventory Cycles and Monetary Policy:* D. M. EISEMANN. *Leading American Statisticians of the Nineteenth Century: II:* P. J. FITZPATRICK. *Rectifying Inspection of a Continuous Output:* F. J. ANSCOMBE. *Ranking Methods and the Measurement of Attitudes:* R. JARDINE. *Randomization Tests for a Multivariate Two-sample Problem:* J. H. CHUNG and D. A. S. FRASER. *A Method of Adjustment for Defective Data:* M. J. SLONIM and C. H. MCCALL. *A Test of Variances:* K. V. RAMACHANDRAN.

Industrial and Labor Relations Review

VOL. 11, No. 4, JULY 1958. *The Conceptual and Legislative Framework of Labor Relations in India:* V. D. KENNEDY. *The Indiana Right-to-Work Law:* F. WITNEY. *Collective Bargaining on the New York City Transit System, 1940–57:* E. SUSSNA. *Decasualization of Employment on the New York Waterfront:* V. H. JENSEN. *Management Unionism and Public Policy on the Railroads and the Airlines:* E. DALE and R. L. RAIMON. *The AFL in the 1920s: A Strategy of Defense:* J. O. MORRIS. *The Welder's Search for Craft Recognition:* H. J. LAHNE. *Unemployment Insurance for Agricultural Workers in Hawaii:* T. K. HITCH.

Harvard Business Review

VOL. 36, No. 5, SEPTEMBER–OCTOBER 1958. *The Dangers of Social Responsibility:* T. LEVITT. *Transcendental Aspects of Business:* A. H. COLE. *Cynicism and Managerial Morality:* B. M. SELEKMAN. *Market Testing:* E. J. ENRIGHT. *New Price Tags for Government Managers:* C. W. ROBINSON. *How to Set Realistic Profit Goals:* B. PAYNE. *Funding and Financing Defense Contracts:* E. F. LEATHEM. *Limits of Persuasion:* R. A. BAUER. *Opportunities for Persuasion:* E. C. BURSK. *Operations Research in Action:* H. J. H. ROY.

Social Research

VOL. 25, NO. 2, SUMMER 1958. *The Politics of Economic Rationality—Observations on the Soviet Economy:* A. D. NOVE. *The Psychology of Social Messianism:* W. STARK.

Foreign Affairs

VOL. 36, NO. 4, JULY 1958. *Disengagement: Why? How?:* H. T. GAITSKELL. *Khrushchev's New Economic Gambit:* P. E. MOSELY. *Soviet Political Life Today:* C. E. BLACK. *Rival Economic Theories in India:* J. K. GALBRAITH. *Germany's Economic Goals:* L. ERHARD. *Economic Strategy of the West:* LORD SALTER.

VOL. 37, NO. 1, OCTOBER 1958. *Democratic Paralysis in France:* J. M. DOMENACH. *African Prospect:* K. NKRUMAH. *An International Development Authority:* SIR R. JACKSON. *"The Socialist Society": India and Japan:* W. W. LOCKWOOD. *Stabilizing Commodity Prices:* SIR S. CAINE. *Raw Materials and National Policy:* P. W. BIDWELL.

The Journal of Accountancy

VOL. 106, NO. 3, SEPTEMBER 1958. *The Place of the CPA in Contemporary Society:* J. L. CAREY. *Current Trends in Fringe Benefits:* M. F. BLAKE. *Allocations of Income Taxes:* R. S. JOHNS.

Revue d'Économie Politique

VOL. 68, NO. 4–5, JULY–OCTOBER 1958. *La France économique en 1957.*

Revue Economique

VOL. IX, NO. 1, JANUARY 1958. *Groupes sociaux et analyse des revenus:* J. LHOMME. *Formation du capital, expansion économique et stabilité monétaire:* J. L. GUGLIELMI. *Financement de la Communauté économique européenne:* C. PENGLAOU. *Une exemple de pôle de croissance: l'industrie textile du Nord de la France:* C. ZARKA. *Taux d'intérêt des obligations remboursables:* E. SCHWARTZ and J. E. WERT.

Journal de la Société de Statistique de Paris

VOL. 99, NO. 1–2–3, JANUARY–MARCH 1958. *La localisation rationnelle des productions agricoles:* J. KLATZMANN. *Mortalité et alcoolisation excessive:* S. LEDERMANN. *Chronique des statistique bancaires et des questions monétaires:* P. CAUBOUE.

Population

VOL. 13, NO. 3, JULY–SEPTEMBER 1958. *Quelques vues sur l'économie et la population dans le monde:* A. SAUVY. *L'évolution de la taille des polytechniciens (1801–1954):* J. SUTTER, R. IZAC and T. N. TOAN. *Privilège des bouilleurs de cru et internements en milieu rural:* S. LEDERMANN, J. TRIVAS and N. HONG. *Développement économique et accroissement de population: un exemple actuel en Indonésie:* N. KEYFITZ. *La population allemande depuis 1939:* F. LERIDON. *Grandeur et population des villes au XVIII^e siècle:* F. de DAINVILLE.

Consommation

VOL. V, NO. 3, JULY–SEPTEMBER 1958. *Les variations saisonnières des dépenses des ménages:* N. TABARD. *Les dépenses médicales en 1956:* G. RÖSCH.

Bulletin de l'Institut de Recherches Économiques et Sociales

VOL. XXIV, NO. 5, JULY 1958. *La conjoncture économique de la Belgique:* O. THÜR.

VOL. XXIV, NO. 6, SEPTEMBER 1958. *L'action économique de la Societé Nationale des Habitations à Bon Marché sur le marché immobilier:* A. MICHAUX. *La rationalisation de la décision d'investir:* P. DE WOOT. *Le signe de l'erreur systématique dans l'estimation de l'élasticité de la demande par la méthode des moindres carrés:* H. BLANPAIN.

Annales de Sciences Économiques Appliquées

VOL. 16, NO. 2, MAY 1958. *Assurance obligatoire en matière de véhicules automoteurs:* R. LIÉNART. *Préparons l'an 2000:* P. ANGOULVENT. *Le transport de passagers sur l'Atlantique Nord:* M. FONTAINE.

VOL. 16, NO. 3, AUGUST 1958. *La publicité collective:* J. VERHEYDEN. *Les tableaux économiques et l'étude des marchés:* I. DIVOY. *Des conditions de l'application de l'évaluation du travail:* L. DOR.

Cahiers Économiques du Service d'Études

No. 20, 1958, *L'Économie Luxembourgeoise en 1957.*

Schmollers Jahrbuch

VOL. 78, NO. 5, 1958. *Zur Soziologie des Arbeiters:* L. KOFLER. *Was heisst ökonomische Theorie?:* F. JONAS. *Konjunkturpolitik und neutrales Geld:* H. BRAEUTIGAM. *Über wirtschaftspolitische Konflikte und ihre Entscheidung:* J. STRUNZ.

Weltwirtschaftliches Archiv

VOL. 79, NO. 2, 1957. *Knut Wicksell:* E. SCHNEIDER. *Intertemporal Price Equilibrium: A Prologue to the Theory of Speculation:* P. A. SAMUELSON. *A Study of Linear Economic Systems:* Y. K. WONG and O. MORGENSTERN. *Über die Deutung monetärer Erscheinungen:* M. W. HOLTROP. *The European Common Market: Risk or Opportunity?:* H. G. JOHNSON.

VOL. 80, NO. 1, 1958. *Zur methodischen Entwicklung der empirischen Nachfrageanalyse in den letzten zwanzig Jahren:* H. SCHMUCKER. *Grundsätze kameralistischer Geldpolitik:* J. KASNACICH-SCHMID. *Einige Bemerkungen zu L. Bosses Aufsatz: "Über die Möglichkeit und den Nutzen von kurzfristigen Wirtschaftsprognosen":* H. EICHMANN.

VOL. 80, NO. 2, 1958. *Johann Heinrich von Thünen als forstwirtschaftlicher Denker:* F. BÜLOW. *Towards a Synthesis of Theory and Policy in Latin American Developmental Economics: The Dynamics of the Economic Policy Revolution in the Transformation of the Periphery:* P. C. M. TEICHERT. *Der Zahlungsbilanzausgleich bei beweglichem Zins:* H. TIMM.

Wirtschaftsdienst (in German with English Digest)

VOL. 38, NO. 1, JANUARY 1958. *Traffic Rates and Business Conditions. The Contribution of Scientific Research in Times of Economic Change:* C. KAPFERER.

VOL. 38, NO. 2, FEBRUARY 1958. *Does it Really Pay to Report Sick? Energy Forecast: Means of Measuring the Market for the Petroleum Industry?:* W. BAUER. *The Position of the Austrian Iron and Steel Industry:* W. STERMANN. *Hamburg's Economic Interest in the Common Market:* H. ROSPRICH.

VOL. 38, NO. 3, MARCH 1958. *Can Wage Claims be Justified at Present? Common Market and Automation under Technological and Economic Aspects:* W. REICHEL. *The Development of the West German Iron and Steel Industry since the War:* K. P. VIETS. *On the Methods of Fuel Oil Consumption Forecast:* D. MÖHRMANN.

VOL. 38, NO. 4, APRIL 1958. *Is there a Menace of an Economic Crisis? Progress in Construction Machinery Engineering:* K. H. GLEITSMANN. *The Corporate Structure of the West German Coal and Steel Industry.*

VOL. 38, NO. 5, MAY 1958. *What are the Trends of the German Fiscal Policy? Road Planning and Road Construction in the Federal Republic:* R. LAUBERG and A. ADAMEK. *Structural Changes of the West German Foreign Trade from 1950 to 1957:* W. SCHLOTE.

VOL. 38, NO. 6, JUNE 1958. *Currency Policy in Europe. Import Trade in the Common Market:* H. KÖHLER.

VOL. 38, NO. 7, JULY 1958. *A Special Policy for the Middle Classes? Town Planning and Location of Industries:* D. MEYER-REINACH. *We Should Increase Our Direct Imports from the Countries of Origin:* A. PUHLMANN.

Zeitschrift für die Gesamte Staatswissenschaft

VOL. 114, NO. 3, 1958. *Die volkswirtschaftliche Gesamtrechnung als Instrument der Wirtschaftspolitik:* H. KÖNIG. *Über einige Methoden der Operations Research:* M. J. BECKMANN. *Zur Verteilung der Nettoinvestitionen auf die Wirtschaftszweige:* H. J. JAKSCH. *Ein Vergleich verschiedener Methoden der Projektion des Nationaleinkommens:* H. GÜLICHER. *Vergleichender Betrachtung der Konjunkturmodelle von R. M. Goodwin und J. R. Hicks:* H. TODT. *Zur Frage der Zinselastizität der Investitionen:* G. MERK. *Die Aussenwirtschaft in der Modellanalyse des ökonomischen Wachstums:* F. ABB. *Die italienische Südfrage: II:* F. VÖCHTING. *Über die soziologische Analyse polylogischer Felder:* H. LINDE.

Allgemeines Statistisches Archiv

VOL. 41, NO. 4, 1957. *Probleme der Agrarstatistik in volkswirtschaftlicher und betriebswirtschaftlicher Sicht:* P. MEIMBERG; K. PADBERG; W. HERRMANN; G. FÜRST; M. RAUTERBERG. *Ziele und Methoden des Indischen National Sample Survey:* A. LINDER. *Übereinstimmung und Unterschiede in der Definition und Messung der Abschreibungen in Betrieblicher und volkswirtschaftlicher Sicht:* K. H. RAABE.

Vierteljahrshefte zur Wirtschaftsforschung

No. 2, 1958. *Zur konjunkturellen Situation:* M. TESCHNER, I. KÖHLER-RIECKENBERG, D. HISS and R. POHL. *Volkswirtschaftliche Gesamtrechnung einschliesslich Geldvermögensrechnung für die Bundesrepublik: Erstes Quartal 1958:* F. GRÜNIG. *Die Anlageinvestitionen und das Anlagevermögen des Verkehrs seit der Währungsreform bis 1956:* H. SEIDLER. *Zur Frage des ungarischen Lebensstandards:* O. V. GAJZÁGÓ.

No. 3, 1958. *Zur konjunkturellen Situation:* M. TESCHNER; I. KÖHLER-RIECKENBERG; *Westdeutschland:* H. MARTELL. *Volkswirtschaftliche Gesamtrechnung einschliesslich Geldvermögensrechnung für die Bundesrepublik:* F. GRÜNIG. *Die bisherige und künftige Belastung der öffentlichen Haushalte durch Auswirkungen des Krieges:* K. D. ARNDT. *Zur Frage der Bemessungsgrundlagen für eine Besteuerung des Kraftfahrzeugverkehrs unter besonderer Berücksichtigung des Bruttotonnenkilometermassstabes:* H. OTTO. *Die Frage des beruflichen Nachwuchses und die Veränderungen der Beschäftigungsstruktur in Westdeutschland 1950–1957:* T. BOLLE.

Wirtschaft und Statistik

VOL. 10, No. 7, JULY 1958. *Die Ernährungsindustrie in der Bundesrepublik Deutschland:* W. RÜDIGER.

Bayern in Zahlen

VOL. 12, No. 8, AUGUST 1958. *Die wirtschaftliche und soziale Eingliederung der Vertriebenen:* F. ZOPFY. *Die Wanderungsbewegung der Vertriebenen und Zugewanderten über die Landesgrenze Bayerns seit 1952:* W. MAIER. *Die Lage der bayerischen Wirtschaft zu Beginn des Sommers 1958:* L. LEIBERICH. *Der Fremdenverkehr in Bayern im Winterhalbjahr 1957/58:* J. LEIPNER. *Die Finanzwirtschaft der kleinen Gemeinden in Bayern:* J. WIRNSHOFER.

VOL. 12, No. 9, SEPTEMBER 1958. *Das Personal der Krankenanstalten in Beyern 1957:* J. FILSER. *Die Viehbestände Bayerns zur Jahresmitte 1958:* J. BUCK. *Die bayerische Bodenseefischerei von 1933 bis 1957:* J. BUCK. *Betriebserhebung im Beherbergungsgewerbe in Bayern zum 1 April 1958:* J. LEIPNER. *Das Bauspargeschäft in Bayern 1957:* R. SCHNEIDER. *Der Wohnungsbau in Bayern 1957:* F. ENGEL.

Aussenwirtschaft

VOL. 13, No. 3, SEPTEMBER 1958. *Die europäische Freihandelszone muss kommen:* a symposium with contributions by H. BACHMANN, G. BAUER, H. C. BINSWANGER, A. BOSSHARDT, W. HUG, J. LADEMANN and A. NYDEGGER.

Schweizerische Zeitschrift für Volkswirtschaft und Statistik

VOL. 94, No. 3, SEPTEMBER 1958. *Tendances et solutions de l'économie énergétique européenne:* H. RIEBEN. *Zukunftsaufgaben der schweizerischen Elektrizitätswirtschaft:* F. WANNER. *Bedeutung der Kernenergie für die schweizerische Wirtschaft:* B. BAUER. *Kartelle und Preisflexibilität:* J. NIEHANS. *Die touristische Konsumfunktion der Schweiz 1929–1956:* G. MENGES.

Monatsberichte des Österreichischen Institutes für Wirtschaftsforschung

VOL. XXXI, No. 6, 1958. *Die wirtschaftliche Lage in Österreich. Die Schichtung der persönlichen Einkommen in Österreich.*

VOL. XXXI, No. 7, 1958. *Die wirtschaftliche Lage in Österreich. Die österreichische Osthandel.*

VOL. XXXI, No. 8, 1958. *Die österreichische Konjunktur zu Beginn der Herbstsaison. Die wirtschaftliche Lage auf den einzelnen Gebieten. Ztrukturvesänderungen der Beschäftigungs eit 1951.*

De Economist

No. 9, SEPTEMBER 1958. *Provinciale rekeningen en de ekonomische politiek van de regionale overheid:* H. RIJKEN van OLST. *De methodiek van rekeningen voor stad en bedrijf:* P. E. VENEKAMP. *Opmerkingen en aantekeningen:* W. L. VALK.

Ekonomisk Tidskrift

VOL. LX, No. 2, JUNE 1958. *Jordbrukets väg:* H. ÅSTRAND. *Bytesbalans, handelskrediter och valutareserv: "Förskjutningspostens" problem: I:* B. HANSEN. *Om indexlan:* G. ARVIDSSON.

Økonomi og Politik

VOL. 32, No. 1, 1958. *Israel fra 1948 til 1958:* H. PUNDIK. *Fra besaettelse til borgerkrig Indonesien:* P. BOEG.

Skandinaviska Banken Quarterly Review

VOL. 39, No. 3, JULY 1958. *Productivity and the Efficient Use of Scarce Resources:* E. LUNDBERG. *Problems and Possibilities in East–West European Trade:* C. H. VON PLATEN. *The Research Department of the Swedish Confederation of Trade Unions:* R. MEIDNER.

Ekonomiska Samfundets Tidskrift

VOL. 11, No. 3, 1958. *Norges økonomi o norske økonomiske problemer i de senere år:* A. SKAUG. *Industriproduktionens utveckling i Finland åren 1925–56:* L. TÖRNQVIST. *Industrilokalisering:* S. LINDSTÅHL.

Liiketaloudellinen Aikakauskirja (Finnish Text, English or German Summaries)

VOL. 7, No. 2, 1958. *Wienen Hochschule für Welthandel 60-vuotias:* HUUGO RANINEN. *Investoinnin kannattavan vähimäistuoton ja optimaalisen jännevälin riippuvuus korko—ja verokannasta:* E. KIVIKOSKI. *The Banking Sector in Social Accounting:* J. LINNAMO. *Determination of the Economic Importance of Transportation on the Functional and the Institutional Basis:* P. GRÖNLUND. *Application of the Standard Cost Accounting based on the Contribution Method in the Metal-using Industry:* E. ARTTO.

Giornale degli Economisti e Annali di Economia

VOL. XVII, No. 5–6, MAY–JUNE 1958. *Sdoppiamento del punto di Cournot nel monopolio per effetto della concorrenza di surrogati:* L. ROSSI. *Note di demografia italiana: estremi regionali della fecondità femminile in Italia:* G. MORTARA. *Perchè l'economia è una disciplina aristocratia:* E. FOSSATI. *Sulle moderne dottrine relative all'incidenza dell'imposta sulle vendite: I:* C. COSTANTINO. *Le partecipazioni economiche dello Stato nella organizzazione odierna:* F. CHESSA. *Sul metodo negli studi congiunturali:* A. FRANCHINI-STAPPO.

VOL. XVII, No. 7–8, JULY–AUGUST 1958. *Schemi di Pantaleoni e visioni odierne in tema di effetti economici delle imposte:* E. D'ALBERGO. *Di alcune distribuzioni di frequenza ad argomento discontinuo connesse a una equazione alle differenze finite:* G. SANTACROCE. *Sulle moderne dottrine relative all'incidenza dell'imposta sulle vendite: II:* C. COSTANTINO.

Banca Nazionale del Lavoro Quarterly Review

No. 46, SEPTEMBER 1958. *The Growth Process in a "Dual" Economic System:* V. C. LUTZ. *Considerations on the Industrialisation of the Mezzogiorno:* F. VÖCHTING. *The Public's Preference for Cash:* F. BRECHLING.

L'Industria

No. 4, OCTOBER–DECEMBER 1957. *Lo scopo e i limiti dell'econometrica:* L. R. KLEIN. *La preferenza rivelata: condizioni essenziali per un ordinamento completo:* H. ROSE. *La teoria dei giochi, la programmazione lineare e l'analisi delle interdipendenze strutturali:* G. TINTNER. *Prospettive di ricerca empirica sulle decisioni d'investimento:* M. TALAMONA.

No. 1, JANUARY–MARCH 1958. *Previsioni sull'incremento della popolazione del mondo:* G. MORTARA. *Due sistemi economici, due concezioni del reddito nazionale:* L. LENTI. *La "funzione del consumo" in Italia come legge di lungo periodo:* F. DI FENIZIO. *Tre concezioni sulla conoscenza umana:* K. R. POPPER.

No. 2, APRIL–JUNE 1958. *Prospettive di sviluppo della popolazione italiana:* L. LENTI. *La circolazione delle persone nella economia europa integrata:* B. BARBERI. *Tre concezioni sulla conoscenza umana:* K. R. POPPER. *Sull'andamento congiunturale delle "opere progettate" per l'edilizia residenziale, in Italia, dal 1948 al 1956:* M. TALAMONA.

Review of the Economic Conditions in Italy (Banco di Roma)

VOL. XII, No. 4, JULY 1958. *The Common Market and the Banking System:* G. DELLA PORTA. *Italian Economy in 1957 and Future Prospects. Foreign Trade in 1957:* L. MAGNANI.

VOL. XII, No. 5, SEPTEMBER 1958. *Some Recent Questions Regarding Monetary Theory:* G. PALOMBA. *The Budget Estimate for the Financial Year 1958–59:* G. LUME. *The Italian Telegraph and Telephone Plan:* G. SCANGA.

Asian Affairs

VOL. II, NO. 3, SEPTEMBER 1957. *Economic Development of Asia and Japan's Collaboration.*
VOL. II, NO. 4, DECEMBER 1957. *Financing Economic Development of Asia.*
VOL. III, NO. 1, MARCH 1958. *Economic Development in Asia and Foreign Trade.*

The Annals of the Hitotsubashi Academy

VOL. VIII, NO. 2, APRIL 1958. *Aspects of the Economic Growth of Japan: Public Investment in Postwar Japan:* C. TAKAHASHI; *An Unrealized Plan—The Value-added Tax in Japan:* M. KIMURA; *Japanese Gains from Trade, 1878–1932:* K. BABA; *Japanese Foreign Trade and Economic Growth, with Special Reference to the Terms of Trade:* K. KOJIMA; *The Employment Problem in Japan in the Next Ten Years:* T. MINOGUCHI; *Labor's Relative Share in the Japanese Manufacturing Industry since 1900:* M. UMEMURA.

Osaka Economic Papers

VOL. VI, NO. 13, FEBRUARY 1958. *Foreign Investment Helpful to Economic Growth of Underdeveloped Nations:* S. SOBAJIMA. *Leontief's Paradox and the Traditional Theory:* T. WATANABE. *Some Notes on Bounded Variables Problem:* T. YOKOYAMA. *Step-Cost:* K. TAKADA. *Rigidity of Wage Rate and the Interfirm Wage Differentials:* Y. UTSUMI. *Bank Liquidity Theory Reconsidered:* S. KAWAGUCHI.

Kyoto University Economic Review

VOL. XXVII, NO. 2, OCTOBER 1957. *Post-war National Life of Japan:* E. HONJO. *Some Notes on Japan's Foreign Trade:* K. MATSUI. *Policy of Democratization and Significance of the Local Administration Investigation Committee:* Y. SHIMA.

The Economic Review (Japanese text)

VOL. 9, NO. 1, JANUARY 1958. *Agriculture and the Labor Market in Japan:* H. INOUE. *"Leontief Paradox" and the Structure of Japanese Trade:* M. TATEMOTO. *Consumption Function and Engel Function:* Y. KURABAYASHI. *Empirical Testing of the Macro-economic Planning in Japan* (In English)*:* S. TSURU.
VOL. 9, NO. 2, APRIL 1958. *Veblen and Marx:* K. OHARA. *An Economic Analysis of the "Farm Problem": Limited Job Opportunities in Non-agricultural Sectors:* S. KAWANO. *The Real National Income as a Criterion of Economic Policy:* H. KUMAGAI. *On the Industrial Combinations in Britain before the World War I:* H. YAMADA.

Moneda y Crédito

No. 64, MARCH 1958. *Cambio monetario exterior y Balanza de pagos:* E. SCHNEIDER. *El puerto de Málaga y la lana de Menorca en la Edad Media:* R. CARANDE. *Distribución y crecimiento en la economía del bienestar:* W. O. THWEATT. *La programación lineal aplicada a un problema de transportes:* J. J. HERRERO ALEIXANDRE.
No. 65, JUNE 1958. *El principio fundamental de la Econometría:* S. VALAVANIS. *Francia y la Comunidad Económica Europea:* R. MOSSÉ. *El nivel de precios en España:* F. G. QUIJANO. *Dinámica de Catastros y Amillaramientos en la Contribución territorial Rústica:* F. S. MUÑOZ.

El Trimestre Economico

VOL. XXIV, NO. 4, OCTOBER–DECEMBER 1957. *La mano de obra, el nivel de vida y los salarios en la ciudad de Oaxaca:* G. R. MARÍN. *Análisis monetario de la formación del ingreso y de los problemas de pagos:* J. J. POLAK. *Teoría del desarrollo económico:* W. A. LEWIS.
VOL. XXV, NO. 1, JANUARY–MARCH 1958. *Notas sobre las Uniones Económicas y sus consecuencias:* R. I. DURET. *John Strachey y el capitalismo contemporáneo:* D. IBARRA. *La inflación por el alza de los costos:* E. JAMES. *El capitalismo, el socialismo y el pensamiento económico de Mao Tse-Tung:* S. KLEIN. *Problemas teóricos del desarrollo económico:* J. A. SCHUMPETER. *Medición del desarrollo económico:* S. KUZNETS.

Boletin de Estudios Economicos

VOL. XIV, NO. 44, MAY–AUGUST 1958. *Corologia del trabajo en España:* R. PERPIÑÁ. *Investigacion operativa: III: Programacion y juegos:* R. P. E. CHACÓN. *Apuntes sobre la parafiscalidad:* J. A. S. ASIAÍN. *"La renta nacional de la U.R.S.S." su evolucion y composicion:* J. L. INDURAIN.

Revista de Economia

VOL. XI, No. 1, MARCH 1958. *Crises et changements géographiques et structuraux au XVI. siècle:* V. M. GODINHO. *O problema do álcool industrial:* U. DA FONESCA NASCIMENTO.

Revista de Ciencias Económicas

VOL. XLV, No. 65, OCTOBER–DECEMBER 1957. *Normas minimas para la confección de estados contables. Algunas consideraciones sobre la desigualdad de los ingresos y los Estudios de Pareto:* E. C. MACDONNELL. *Ecos de la IV Conferencia Interamericana de Contabilidad:* E. D. RIGANTI.

Economic Bulletin of the National Bank of Egypt

VOL. XI, No. 2, 1958. *The Recession Continues. Capital Import and Control of Production. First Report of the Sudan Currency Board. Economic Conditions in Egypt in 1957. Quarterly Economic Review, 1958.*

Voprosy Ekonomiki (Russian text)

No. 4, 1958. *In the Interests of Communist Construction. The Leninist Plan for Peaceful Socialist Construction:* I. GLADKOV. *The Accomplishment of Lenin's Programme of Electrification:* E. GERONIN. *For the Publication of a Complete Collection of the Works of V. I. Lenin:* N. KULAGIN. *Some Problems of the Development of Intensive Agriculture:* D. POLYANSKY. *On the System of Equipment Needed for the Complex Mechanisation of Agriculture:* A. KIRYUKHIN. *Problems of Engineering Specialisation in an Economic Region:* Z. DRUGALEVA, L. ZHUKOVA and M. FEDOTOV. *On the Operation of the Law of Money Circulation under Socialism:* G. KAGANOV. *Problems of the Economic Links between Industry and Trade in the New Conditions:* M. LIFITS. *The Co-operation of the Czechoslovak Republic with Economically Underdeveloped Countries:* N. SEMIN. *On Certain Attempts to Distort the Facts on the Progress of the Soviet Economy:* A. KOZLOV. *Problems of Commercial Production and the Operation of the Law of Value under Socialism:* V. ASTAKHOV, L. VOZNESEANSKY, F. VOLKOV and A. YUDKIN. *Indicators of the Efficiency of Capital:* M. USYK. *Problems of Organising and Planning Municipal Economy in the U.S.S.R.:* A. SKVORTSOV. *The Economics of Orchards and Vineyards in Collective and State Farms of the U.S.S.R.:* P. BOBROVSKY. *Accounting and Book-keeping Personnel on Collective Farms in the Light of Present Tasks:* V. ROZHIN. *The Scientific Research Activity of the Institute of Economics during 1957:* N. LINKUN. *The Co-ordination of Research Work in Economics within the Academy of Sciences of U.S.S.R. Problems of the Economic Efficiency of Capital. The Advantages of the Socialist Economic System.*

No. 5, 1958. *For a Thorough Upsurge of the Chemical Industry. The Triumph of the Theory of Scientific Communism:* G. KOZLOV. *The Economic Teachings of Marx and His Contemporary Critics:* S. VYGODSKY. *Some Problems of the Further Development of the Collective Farm System:* S. STRUMILIN. *Collective Farms at a New Stage:* V. MANYAKIN. *On the Pattern of the Soviet Fuel Balance:* E. SOKOLOVA. *Some Problems in the Utilisation of Labour Reserves. Characteristics of Industrial and Foreign-trade Development of the German Democratic Republic:* G. KOLMEY. *Bourgeois Economists on Soviet Industry:* S. KHEYMAN. *When a Long-felt Want is Fulfilled:* V. SHAMBERG. *On the Problem of the Economic Efficiency of Capital in Socialist Agriculture:* N. KAROTAMM. *On Scope for Reducing the Construction Cost of Dwellings:* B. KOLOTILKIN. *Agricultural Development in the European People's Democracies. Competition for a Popular Text-book on Political Economy. The Problem of Manifold Development of the River Amur and Soviet-Chinese Scientific Co-operation:* A. MARGOLIN.

No. 6, 1958. *The General Interests of the State Must Be a Centre of Attention. Progress in the Chemical Industry is One of the Most Important Politico-economic Tasks:* V. MEZENTSEV. *The Re-organisation of Machine-tractor Stations and Some Problems in the Further Development of the Collective Farms of the Stalingrad Region:* I. ZHEGALIN. *Marx on Socialism:* L. LEONTEV. *On a Certain Treatment of the Law of Preferential Growth of Producer-goods Output:* A. PASHKOV. *Some Problems of Price Fixing for Consumers' Goods:* L. SKVORTSOV. *Improve the Role of the Enterprise Fund:* I. USATOV. *The Significance of Economic Co-operation and the International Division of Labour for Building Socialism in Bulgaria:* S. SHARENKOV. *On the Economic Links between Town and Country in the New Conditions:* M. MAKAROVA. *On Basic Criteria and Indicators of the Economic Efficiency of Capital in Industry:* G. BAKULEV. *Measures for Improving the Management of Industry, Finance and Trade in China:* V. KURAKIN. *On the Economic Indicators for Workshop and Intra-factory Cost Accounting:* I. KARNUS and L. SHNEIDERMAN. *Problems in the Strengthening of Cost Accounting in Industry:* A. SMIRNOV and I. ERMAKOV. *Economic Problems Studied at the Third All-Union Building Conference. Meeting of Economists on Peaceful Co-operation and International Understanding:* V. DYACHENKO.

Planovoe Khozyaistvo (Russian text)

No. 6, 1958. *Economic Planning must be up to its Increased Tasks. In Every Way Develop the Synthetic Materials Industry:* V. BUSHUEV. *The Shortening of the Working Day—A Most Important Political and Economic Task:* M. YAMPOLSKY. *Questions of the Further Development of the Building Industry:* F. POLOZHISHNIK. *Improve the Work of Drawing up Plans and Estimates for Building:* F. DOBRYNIN. *An International Meeting of Economists:* A. EFIMOV. *Important Changes in the Organisation of Czechoslovak Industry:* O. ŠIK. *Ways to Increase the Food Resources from Vegetable Oil:* S. AVAKOV. *Improve the Organisation of Shipping Cement:* L. MERKIN. *A New System of Price-fixing.*

No. 7, 1958. *The Unceasing Anxiety of the Party for Massive Progress in Socialist Agriculture. The Organisation and Planning of Material-technical Supply under the New System of Industrial and Building Management:* P. KARPOV. *The Basic Tasks in the Development of Oil Extraction in the U.S.S.R.:* V. KALAMKAROV. *The Technical Economic Efficiency of Automated Production Lines:* A. VLADZIEVSKY. *The Bringing into Agricultural Use of Land in the Volga–Akhtubinsk Catchment Area:* I. GANEKO. *On the Problem of Economic Valuation of Land:* S. CHEREMUSHKIN. *Main Trends in the Development of the Leningrad Economic Region:* M. KASHTANOV. *Prospects for the Development of the Productive Resources of East Kazakhstan:* D. BOGORAD. *On the Methodology of Computing Productive Capacity in Industry:* V. KUROTCHENKO and P. OSADA. *Intra-factory Planning and Economic Indicators of Production:* I. MIRONOV. *Improving Methods of Planning Gross Production in Engineering Enterprises:* F. SABITOV.

Finansy S.S.S.R. (Russian text)

No. 4, 1958. *An Important Stage in the Development of the Collective Farm System. Symposium on the Decision to Reorganise Machine-tractor Stations:* K. LARIONOV (*Procurement Prices*), B. GINZBURG (*Equipment Sales*), P. TALMINA (*Finance*), P. PINCHUK (*Farm Capital and Savings*), L. BRAGINSKY (*Credits*), M. KURYATOV (*State and Farm Interests*) and A. VYALOVSKY (*Examples of Sales*). *Strengthen the Direction of District and Municipal Finance Offices:* M. KALIBIN and V. KHVALYNSKY. *The Financial Situation of Building Organisations has Improved:* S. ORLYUK. *Fully Discover Reserves for Lowering Building Costs:* A. DANILOV. *The District Finance Office and Enterprise:* G. PARFENOV. *Stronger Control over Fulfilment of Geological Survey Work:* I. DUBSON. *How We Fulfilled the Plan for Stocks:* A. BRYNSKY. *Transfer to Rural Councils All Work Connected with the Agricultural Tax. The Organisation of Saving Banks in Czechoslovakia:* B. SUHARDA. *Financial Institutions of the European Common Market and Euratom:* M. PANOV.

No. 5, 1958. *A Historic Decision. Some Problems of the Work of Finance Agencies in Connection with the MTS Re-organisation:* G. KUTUZOV. *Ways to Cheapen Building:* P. PODSHIVELENKO. *Tasks of Trade-unions in the Civil Service:* G. PETELIN. *The Budget and Economic and Cultural Development in Moldavia:* V. ARPENTEV. *In Every Way Expand Correspondence Courses for Finance Officials:* P. PSHENICHNY. *On Financial Planning in Enterprises:* R. VINOKUR. *The Organisation and Planning of Finance in Industrial Enterprises under the New Conditions:* P. ZHEVTYAK. *Results of the Re-organisation:* E. RUZANOV. *Help to Enterprises and Control of Their Operation:* M. SHERIKH.

No. 6, 1958. *Cheapen Building and Strengthen Financial Control. In Every Way Improve Internal Accumulation in Industry:* P. MOROZOV. *The Budget in the Service of the Economy and Culture of Estonia:* A. TIKHANE. *For a Further Improvement in the Work of Kirgiz Finance Agencies:* A. SUYUMBAEV. *Some Problems of Budgetary Classification:* S. GLEZIN. *How to Establish Criteria for Working Capital:* I. DOLGIN. *Reserves Brought into Action:* A. IVANOV. *A Pyramid:* A. KRASNOV. *Symposia on the Financial Inspectorate, the Rationalisation of Financial Agencies and State Lotteries. A Leading District Finance Office:* M. OSIPOVICH.

Dengi i Kredit (Russian text)

No. 4, 1958. *Symposia on Farm Credits. Control by the State Bank of the Plan for Co-operative Deliveries:* P. NOSKA and M. PESSEL. *Bank Control in the Sphere of Cash Supply of the Economy:* Ts. KHAITINA. *The Development of the Money System of the Popular Democracies:* L. KADYSHEV. *Problems of Clearing and Credits by Special Loan Accounts. Inter-University Scientific Conference on Ways to Improve Bank Credit Supply. Cheque Circulation and Clearing Accounts in the U.S.A.:* Z. KATSENELENBAUM.

No. 5, 1958. *The Further Strengthening of the Collective Farm System and Tasks of the State Bank:* V. VOROBEV. *On the Unification and Improvement of Short-term Credit Supply and Accounting*

(*correspondence*). *The Characteristics of the Working Capital and Credit Needs of Consumer Co-operatives:* V. KITOV. *Control of Wage Disbursements in the Coal Industry:* M. KAZALETOV. *The Provision of Credits to Enterprises of Light Industry:* A. PETROV. *Credit on Bills of Lading on Request* (*correspondence*). *Improve Credit Practice in the Timber Industry* (*correspondence*). *Methods for the Analysis of Overheads in the Ministry of Grain Procurement:* P. DEMINA and M. ROZOVOI. *State Foreign Trade Banks of Capitalist Countries as an Instrument of Foreign Trade Expansion:* L. FREI.

No. 6, 1958. *Credit to Industrial Enterprises on the Turnover of Goods:* M. ARONOVA and M. RABINOVICH. *A Progressive Method for Granting Credits* (*correspondence*). *For a Further Strengthening of Accounting Groups:* M. GINDIN. *Unification of Credit Documentation:* S. ERSHOV. *Payment by Cheque:* T. CHERNYSHOVA. *A Comment:* I. MOKAN. *Strengthen Cost Accounting in Enterprises:* I. DOLGIN. *The Bank and the Regional Economic Council:* I. KOPYLOV. *The Systematisation of Accounts Rendered by Economic Organisations to the State Bank:* S. EGOROV and V. KULMANOVA. *The Balance of Payments of the German Federal Republic and the Exchange Situation in Western Europe:* A. EVREISKOV.

Vestnik Statistiki (*Russian text*)

No. 4, 1958. *Interview of N. S. Khrushchev with the Editor of the American Newspaper* Journal of Commerce. *The Triumph of the Great Ideas of Marxist Leninism:* V. I. LENIN. *On the Analysis of Statistical Data:* S. GUREVICH. *The First Balance of the National Economy of the U.S.S.R.:* I. MOROZOVA. *Scope for Raising Labour Productivity in Agriculture:* D. DUMNOV. *Some Problems of Computing the Agricultural Area Indices:* S. YUGENBERG. *Censal Zoning—The Most Important Stage in the Preparation for the Census of Population:* K. SMIRNOV. *On the New Forms for Labour and Wage Reports by Industrial Enterprises:* V. GUREV. *Monthly Reports on Stock Breeding by Collective and State Farms:* K. DAVYDOV.

No. 5, 1958. *Some Opinions of K. Marx on Statistics. Decree on the All-Union Census of Population in 1959. On the Problem of the Statistical Analysis of Specialisation and Co-operation in Industry:* M. LESHCHINSKY. *On the Characteristics of the Turnover of Farm Market Trade:* N. TITELBAUM. *On the Relationship between the Wage Bill and Gross Output:* R. KRESIN. *The Problem of the Chain Method for Isolating Variables:* L. KAZINETS. *On the Sample Census of Population, Employment and Housing in the German Democratic Republic:* I. LOGACHEV. *State Plan Fulfilments of the European Popular Democracies:* L. YASNOVSKY. *How Occupation Will Be Defined in the Census of Population:* V. ROZDYALOVSKAYA. *Centralised Accounting and Statistics in Districts:* V. BULGAKOV. *On the Significance of Centralisation in District Statistical Inspectorates:* I. EROKHOVETS and I. SEREBRENNIKOV. *Give More Attention to Primary Accounting in Collective Farms:* P. KAYAN. *New Practice in Recording Sown Area, Selected Seed Area and Actual Harvests in 1958:* N. ZHIVILIN. *The Publishing Plan of Gosstatizdat:* A. B.

No. 6, 1958. *Prepare and Execute in an Exemplary Manner the All-Union Census of Population. Current Problems of Valuation and Statistics of Capital Construction:* K. VINOGRADOV. *The Census of Equipment Machinery:* A. BELYAKOV. *Methods of Accounting Input-norm Fulfilment:* D. MEERZON. *On Computing Personal Income and Outlays:* G. POLYAK. *Bourgeois Criminal Statistics in the Service of the Capitalist State:* S. OSTROUMOV. *Processing of Family Budget Surveys on Card-punch Machines:* G. VLADYKIN. *The Mechanisation of Statistical Processing:* E. STAROSELSKY and D. TSAGARELI. *A Consideration of Problems of Chemical Industry Statistics:* V. DZHAPARIDZE. *Improve the Preparations for the Census of Population in the Uzbek S.S.R.:* D. ILENKOV and E. DANILOV. *Courses for Improving Qualifications:* E. RODINA. *A Meeting of Directors of Statistical Administrations of the RSFSR:* V. UVAROV and S. LEVASHEV.

Ekonomista (*Polish text, English and Russian summaries*)

No. 2, 1958. *Adam Krzyzanowsky:* O. LANGE. *The Effectiveness of Industrialisation:* J. ZAGÓRSKI. *Agricultural Policy in Sweden:* S. HOLMSTRÖM. *The Law of Value, Prices and Farm Economics:* L. RZENDOWSKI. *Family Budgets Research:* J. ŁOŚ. *The Problem of Under-developed Countries in the Light of the Law of Unequal Growth:* E. NABIEL. *The Economic Situation in Japan:* Z. DOBRSKA. *The Swedish School in Political Economy:* J. NOWICKI.

No. 3, 1958. *Remarks on the Marginal Calculus in Socialism:* W. BRUS. *The Prices of Basic Raw Materials:* M. KALECKI. *Changes in the Structure of Earnings in the Period 1949–56:* M. NASIŁOWSKI. *An Attempt at an Estimate of Obligatory Deliveries by Peasants during the*

Period of the Six-year Plan: Z. KOZŁOWSKI. *Some Problems of Labour Turnover:* A. SAPAPATA. *On the Question of Capitalist Development in Agriculture in Congress Poland and Galicia:* M. MIESZCZANKOWSKI. *The Fall in Raw Material Prices on World Markets:* Z. DOBRSKA and A. SZEWORSKI. *The Conference on Price Theory in a Socialist Economy:* J. LISIKIEWICZ.

Gospodarka Planowa (Polish text)

APRIL 1958. *Some Current Economic Problems Connected with the Implementation of the Decision of the Ninth Plenum. Should We Be Pessimistic because of High Costs of Production in New Industrial Enterprises?:* Z. SPRYCHA. *Further Remarks on Profit-sharing Schemes:* W. KRENCIK. *The Long-range Programme for the Development of Vegetable-growing:* W. KOZAK. *The Prospects for Future Progress in the Building Materials Industry and its Coal Input:* B. KARSKY, J. KORNGUT and M. ZUBELEWICZ. *Methodological Notes on Regional Development Programmes:* B. WINIARSKY. *On the Calculation of Capital Efficiency:* J. STEFAŃSKY. *Remarks on Money and Credit:* A. ZWASS. *Some Problems of Price-fixing and the Theory of Marginal Cost Pricing:* T. KASPRZAK. *Well-organised Housing Statistics is What We Need:* S. W. *The Main Problems of the German Democratic Republic's Five-year Plan:* K. KRASZEWSKI. *On the Application of Electronic Computers to Economic Statistics and Planning:* J. Ż. *Remarks on Regional Development Programmes:* K. KISILEWSKI. *Accumulation Problems in the Long-term Plan:* M. RAKOWSKI. *A Comment:* W. LISSOWSKI. *On the Role and Importance of the Private Sector in Our Economy:* I. CHODAK.

MAY 1958. *The Prospects for Plastics Production in Poland:* J. PRZETAKIEWICZ. *The Structure of Food Retail Prices:* L. BESKID. *Is the Present Price Structure for Agricultural Produce Correct?:* S. FELBUR. *Investments in Long-term Programming:* Z. KNYZIAK. *Some Problems on Economic Activity in the Olsztyn District:* E. BUGDENS and S. G. WIAŹDZIŃSKI. *In Defence of an Investment Efficiency Index:* M. RAKOWSKI. *The New Agricultural Policy in the U.S.S.R. since 1953:* Z. LEWANDOWICZ. *The Economic Situation in the U.S.S.R. and the Popular Democracies in 1957:* L. CIAMAGA. *Is Fixed Capital Correctly Valued?:* B. PRYZIŃSKI. *The Needs for Rural Building:* H. SMACHNY. *The Profitability of State Farms, if Properly Understood, Is the Only Index of Their Success:* Z. KARCZEWSKI.

JUNE 1958. *Trends in Industrial Development in the Long-term Economic Plan:* W. BUCH. *On New Forms of Economic Co-operation between Socialist Countries:* M. RAKOWSKY. *The General Principles of Economic Calculation in Regional Planning:* J. KOLIŃSKI. *Methods of Economic Calculations in Long-range Regional Planning:* W. LISSOWSKI. *Changes in the Methods of Economic Planning for 1959:* E. SZYMAŃSKI. *Conference of Economists on Problems of an Enterprise:* J. ZIELENIEWSKI and L. ZĄBKOWICZ. *A Few Remarks on the Organisation of an English Concern:* M. KALECKI. *The Western European Economy According to the U.N. Economic Survey of Europe in 1957:* J. ZDANOWICZ. *Current Problems of the Hungarian Economy:* R. ŁAZAREK. *Must Poland Import Coking Coal?:* A. PIEŃKOWSKI. *On the Work of Regional Statistical Units:* S. KOVALSKI. *The Polish Economy since 1950 through the Eyes of the Economic Commission for Europe.*

JULY 1958. *Reconstruction and Development in the Western Territories—Facts and Figures. Fixed Capital, Labour and Production in Polish Industry:* W. LISSOWSKI. *The Problem of Economising Fixed and Working Capital in Experimenting Enterprises:* J. KUŹBA. *Methods of Evaluating the Profitability of Foreign Trade:* B. PRYZIŃSKI. *On the Prices of Luxury Goods:* Z. DĄBROWA. *The Inter-relations between the National Economic Plan and the State Financial System:* Z. RAJEWSKI. *The Foreign Trade of the U.S.S.R. and the Popular Democracies According to the U.N. Economic Survey of Europe in 1957:* S. P. *Some Data Concerning the Czechoslovak Economy from Czechoslovak Statistical Publications:* E. KOZŁOWSKA. *Changes in the Agriculture of the German Democratic Republic:* M. ZIOMEK. *The Decentralisation of Industrial Management in Capitalist Countries:* S. CHOJECKI. *On Economy in the Utilisation of Fixed Capital:* Z. WITKOWSKI. *Forecast of Changes in the Location of Population and Man-power by 1975:* B. WEŁPA. *How to Improve the Organisation of Farm Equipment Sales:* A. SZYNKARCZUK. *Some Observations of the Profitability of the Application of Artificial Fertilisers:* D. GRUSZCZŃSKA.

Plánované Hospodářství (Czech text)

Nos. 6–7, 1958. *New Methods of Drafting Five-year and Annual Plans:* V. HORÁLEK and V. VIK. *Planning Industrial Output and Marketing:* L. MATĚJKA. *Planning the Marketing and Supply of Raw Materials and Semi-manufactures in Physical Units:* M. KULICH. *Planning Capital Construction:* M. FRANĚK and M. STREJČEK. *Long-term Incentive Norms in Enterprises:*

J. LIBUS. *Man-power Planning:* M. SOKOL. *Planning Production Costs and Profits:* B. KLIČKA. *Planning Technical Development:* E. LIŠKA. *Planning the Economy of National Committees:* J. KONÁREK. *Accelerate the Expansion of the Chemicals Industry:* J. PELC. *The Distribution and Specialisation of Agriculture in Slovakia:* J. JANOVIC. *Long-term Problems in the Development of Living Standards in Czechoslovakia.*

No. 8, 1958. *The Programme for the Construction of a Socialist Society. Functions of the Planning Commissions of National Committees:* R. RYCHTAŘÍK. *Some Problems of Capital Investment in the Consumer-goods Industry:* M. JIRÁK. *Problems of Industrial Location:* O. ZÚREK. *The Costs of House Building:* A. VANĚK. *Planning the Building Industry:* O. STIBOR. *On the Law of the Proportional Development of the National Economy:* D. FIŠER. *Raising the Standard of High Economic Schools:* V. SEDLÁK. *Commodities under Socialism:* J. SPIŠIAK.

Planovo Stopanstvo (*Bulgarian text*)

No. 2, 1958. *The Immense Programme for New Victories in Building Socialism in Our Country. Ten Years of the State Planning Commission. On Our Utilisation of Lignite:* I. BAICHEV. *Scope for the Extension of Perennial Plantations in Our Country:* TS. MARINOV. *Economising Materials is a Major Reserve for Executing the 1958 Plan:* P. OLOVANOV. *Some Fundamental Problems in the Long-term Development of Our Railway Transport:* I. ANGELOV. *Methodology for Wage Planning in Industrial Enterprises:* K. POPOV.

Finansi i Kredit (*Bulgarian text*)

No. 3, 1958. *Fulfil the Plan for State Revenue. Specific Standards for the Working Capital of Industrial Enterprises on the Basis of the Average Annual Production Programme:* D. VAKARELSKI. *The Socialist Characteristics of the Sofia Municipal Budget for 1958:* I. PALIISKI. *Some Problems of Balance of Payments and Financial Planning:* I. SEMAKH. *Plan Fulfilment as a Criterion for the Payment of Premia to Management and Industry:* R. KOLEV and I. LAMBEV. *Some Factors in Construction Influencing Changes in Labour Productivity and Wage Outlays Connected Therewith:* M. BALABANOV. *The Devaluation of the French Franc and the Finnish Mark.*

No. 4, 1958. *A Magnificent Programme:* K. LAZAROV. *The New Law on Property Insurance:* V. MARKOV. *The Balance of Personal Money Income and Outlay in 1958:* N. GUGOVSKI and N. LAZAROV. *Towards the Improvement of Finance Officials' Qualifications:* V. KHRISTOFOROV. *Cost Accounting in MTS:* V. TODOROV. *The State Lottery:* P. PANTALEEV. *The Role of Finance Agencies in Extending the Competence of Municipalities:* L. DULEV. *The Functions of State Credit in Chinese Agricultural Development:* LI SHAO YUI.

No. 5, 1958. *Marxism, an All-conquering Teaching. The Fifth Congress of the Trade-union of Civil Servants and Local Government Officials and Tasks of Finance Officials:* M. GANEV. *Credit by Means of Loans on Turnover—a Way of Strengthening Credit Relationship between the National Bank and State Industrial Enterprises:* D. KASABOV. *The Financial Aid of Our Popular Democratic State for the Development of the Co-operative System:* K. ZANEV. *Functions and Work Methods of Finance Agencies in Economic Financing:* K. ZHEZHEV.

Ikonomicheska Misl (*Bulgarian text, French and Russian Summaries*)

No. 3, 1958. *Revisionism—the Main Ideological Arm of Imperialist Reaction. The Completion of the Second Five-year Plan—a New Stage in the Progress of Socialist Construction in Bulgaria. Problems of Profit Distribution and the Strengthening of Self-financing in State Industrial Enterprises:* G. PETROV. *On Certain Problems of Bulgarian Exports:* G. POPISAKOV. *The Foreign Trade of Greece:* S. PAVLIDES. *The Present Situation of the Working Class in the Main Capitalist Countries:* L. ENCHEV. *Signs of the Crisis in the U.S. Economy:* T. VULCHEV.

No. 4, 1958. *The Communist Party—Inspirer and Organiser of Socialist Construction. The Vitality of Marxist Economic Doctrine. Capital Investment as a Factor in Expanding Social Product:* K. DOBREV. *On the Raw Material Supply of Our Textile Industry:* K. LAZAROV. *Industry during the Third Five-year Plan:* V. DONKOV. *Agriculture in the Draft Directives on the Third Five-year Plan:* P. KIRANOV. *Scope for the Creation of New Industries in Bulgaria:* P. KALEV.

Ekonomist (*Serbo-Croat text, English summaries*)

No. 3–4, 1957. *An Estimate of the National Wealth of Yugoslavia:* I. VINSKI. *Towards the Development of Our System of Social Accounting:* G. GRBIĆ. *Research into the Structure and Elasticity of Demand:* V. TRIČKOVIĆ. *Terms-of-Trade Indices:* P. MIHAILOVIĆ. *Rent Policy in Some Countries of Western Europe:* V. VELJKOVIĆ.

Statistikai Szemle (Hungarian text, English and Russian summaries)

APRIL 1958. *The Level and Intensity of Production in Co-operative Farms—II:* J. FILE and J. SZILÁGYI. *Some Problems in the Preparation of the New Law on Statistics:* E. REMETEY. *Some Questions of Accounting Buildings in Natural Units:* GY. LONTI. *The Proportion of Living and Incorporated Labour in the Value of a Product:* A. BRÓDY. *The Evolution and Situation of Mechanical Data-processing in Hungary:* M. PETÖ. *The 1923–24 Balance of the Soviet National Economy:* Z. KENESSEY. *The Index of Agricultural Production in Capitalist Countries:* T. KÁRMÁN.

MAY 1958. *Plan of the 1960 Hungarian Census:* A. KLINGER and E. SZABADY. *Methodological Problems of the Calculation of Real Income of the Peasantry:* J. ARVAY. *Level and Intensity of Production in Co-operative Farms—II:* J. FILE and J. SZILÁGYI. *Data on Ten Years of Nationalised Manufacturing Industry:* A. NYILAS. *Some Problems of Bread-grain Supply:* F. ZALA. *A Sampling Survey on Living Conditions of Engineers and Technicians:* A. HEGEDÜS. *The Financial Incentives of Workers in Production and the System of Controlling Average Wages:* GY. BÁCS. *The Hungarian Post Office:* GY. MÓDER. *The Session of the Working Group of the Conference of European Statisticians on Short-term Economic Indicators:* A. MÓD. *The System of Index Numbers of Living Standards and the Method of Their Computation in Rumania:* L. D.

Közgazdasági Szemle (Hungarian text, English and Russian summaries)

No. 6, 1958. *Some Major Problems of the National Economic Balance-sheet System:* S. AUSCH. *A New Stage in the Development of the Soviet Collective Farm System:* L. CSETE. *On Limits to Precise Production-cost Estimates and on Pricing:* L. LUKÁCS. *The New Procurement System and Central Stock-piling:* B. CSENDES. *Problems of the Economics of Foreign Trade as Discussed in Polish Publications:* A. NAGY. *The Expansion of Japan on the Capitalist World Market:* L. BIRÓ. *Discussion on Candidates' Dissertations:* J. Sz. and Zs. E.

Probleme Economice (Rumanian text, English, French and Russian Summaries)

No. 5, 1958. *Karl Marx and the Fight Against Contemporary Revisionism. The Beginnings of the Activity Laid by the Founders of Scientific Communism, K. Marx and F. Engels:* Z. BRÎNCU. *Proletarian Internationalism—Basis of the Economic Relations between Socialist Countries:* I. ANGHEL. *Against the Bourgeois and Revisionist Adulteration of the Economic Role of the State in Contemporary Capitalism:* P. DAN. *Schumpeter and the Reformist Current in France:* H. CLAUDE. *Progress and Forms of Present-day Socialist Agricultural Co-operation:* N. BELLI. *Changes in the Foreign Trade Structure of Some European Socialist Countries:* I. BURŞTEIN. *The Causes and Evolution of the Financial Crisis in France:* S. FIRU. *The Use of the National Income in the Appreciation of the Economic Efficiency of Industrial Investments:* P. JICA.

No. 6, 1958. *The Preparation and Execution of the Revolutionary Act of Nationalising the Main Means of Production:* S. ZEIGHER. *The Agrarian Problem in G. Plekhanov's Work:* V. MALINSCHI. *The Post-war Industrial Cycle and the New Over-production Crisis:* E. VARGA. *The Bourgeois Theory of Mass Welfare and West German Realities:* GH. NISIPEANU. *Criticism of Some Bourgeois and Revisionist Theories on West European Economic Integration:* I. ANGHEL. *The Problem of Economic Efficiency in the Territorial Distribution and Specialisation of Socialist Agriculture:* O. PARPALĂ. *The Distribution of Production in Collective Farms:* B. NICOLAE. *The Main Problems of Cost Price in the Consumer-goods Industry:* S. COSMA and M. IAROVICI.

NEW BOOKS

British

BULL (G.) and VICE (A.). Bid for Power. London: Elek Books (14 Great James Street, W.C.1), 1958. 9″. Pp. 238. 25*s*.

[This is a study, written by two financial journalists, of the take-over bid as it has been practised in this country in recent years. The exploits of Mr. Clore, Mr. Fraser, Mr. Wolfson and other less well-known practitioners are recounted with a wealth of detail, financial and personal. The authors' purpose is partly to tell a story of interest in itself, and partly to give guidance to small shareholders in companies that become subject to bids. Their reflections on the broader economic significance of the take-over bid are brief but to the point.]

BULLARD (SIR R.). The Middle East. A political and economic survey. 3rd Edition. London: Oxford University Press for the Royal Institute of International Affairs, 1958. 8½″. Pp. xviii + 569. 45*s*.

[The third edition of this comprehensive country-by-country survey, which is mainly factual in scope, has been completely rewritten. The revision is the work of many hands, under the editorship of Sir Reader Bullard, formerly British Ambassador in Persia. It has been brought up to date to autumn 1957.]

BURN (D.) (Ed.). The Structure of British Industry. A symposium. In two volumes. National Institute of Economic and Social Research, Economic and Social Studies, No. XV. Vol. I: pp. xvii + 403; 45*s*. Vol. II: pp. xiii + 499; 50*s*. London: Cambridge University Press, 1958. 9½″.

[To be reviewed.]

CARR-SAUNDERS (A. M.), CARADOG JONES (D.) and MOSER (C. A.). A Survey of Social Conditions in England and Wales, as illustrated by statistics. London: Oxford University Press, 1958. 9″. Pp. xxi + 302. 25*s*.

[To be reviewed.]

CARTER (C. F.) and WILLIAMS (B. R.). Investment in Innovation. London: Oxford University Press, 1958. 9″. Pp. ix + 167. 15*s*.

[To be reviewed.]

COOK (P. LESLEY) with the collaboration of COHEN (RUTH). Effects of Mergers. Six studies. Cambridge Studies in Industry. London: Allen & Unwin, 1958. 9″. Pp. 458. 42*s*.

[To be reviewed.]

CORLETT (W. J.). The Economic Development of Detergents. Industrial Innovation Series. London: Duckworth, 1958. 9″. Pp. 208. 25*s*.

[To be reviewed.]

COTGROVE (S. F.). Technical Education and Social Change. London: Allen & Unwin, 1958. 9″. Pp. 220. 25*s*.

[Reviewed in this issue.]

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF BRISTOL. Grassland in England and Wales, by V. H. BENYON; Report No. 106; 9″; Pp. 59; 5*s*. Self-feeding of Silage in Devon, 1957/58, an Interim Report by V. H. BENYON and J. A. LANGLEY; Report No. 107; 10½″; Pp. 33; 2*s*. 6*d*. Farm Organisation and Incomes in South West England, 1956; Report No. 108; 9″; Pp. 61; 5*s*. An Economic Study of the Broccoli Crop in West Cornwall, 5-year investigation 1952/53 to 1956/57; Report No. 109; 9″; Pp. 50; 5*s*. Newton Abbot: Department of Agricultural Economics, University of Bristol, 1958.

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF MANCHESTER. Farm Management Survey, Financial Results, 1955–56, and 1956–57; Pp. 40; 3*s*. 6*d*. Milk Production in North-West England, an economic survey of 53 herds, 1955–57, by T. W. GARDNER and J. E. HOLT; Pp. 49; 3*s*. Manchester: Department of Agricultural Economics, Faculty of Economic and Social Studies, University of Manchester, 1958. 10″.

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF READING. Financial Results on Farms in the Southern Province in 1954–55, 1955–56 and 1956–57, by G. B. BISSET and C. H. BLAGBURN; Farm Management Survey Report No. 7; 9½″; Pp. 51; 5*s*. Some Economic Aspects of Pig Production 1956/57, by D. S. THORNTON; Miscellaneous Cost Studies No. 35; 10″; Pp. 20; 2*s*. 6*d*. Reading: Department of Agricultural Economics, University of Reading, 1958.

DEPARTMENT OF AGRICULTURE, STATES OF JERSEY. Work Study; Farm Management Report No. 3; 10½″; Pp. 20. Silage, 1957; Farm Management Report No. 4; 10½″; Pp. 31. Milk Production Costs in Jersey, 1957–58; Report No. 11; 13″; Pp. 79. St. Helier; Department of Agriculture (Agricultural Economics, Victoria Chambers, Conway Street, St. Helier), 1958.

EDWARDS (R. S.) and TOWNSEND (H.). Business Enterprise, its Growth and Organisation. London: Macmillan, 1958. 9″. Pp. xvii + 607. 60*s*.

[To be reviewed.]

ENKE (S.) and SALERA (V.). International Economics. Third edition. London: Dennis Dobson, 1958. 9″. Pp. xviii + 606. 42*s*.

[This book, one of the most successful American texts on international economics, has been substantially altered in its third edition. The emphasis has been shifted away from pure theory towards problems of policy, and many topics are covered which were not included at all before, such as Western European Regionalism. In view of the difference in scope, the publishers are continuing to make available the previous edition, which deals more rigorously with theoretical problems.]

FIRESTONE (O. J.). Canada's Economic Development, 1867–1953, with special reference to changes in the country's national product and national wealth. International Association for Research in Income and Wealth, Income and Wealth Series VII. London: Bowes & Bowes, 1958. 8½″. Pp. xxvi + 384. 45*s*.

[To be reviewed.]

HAAS (E. B.). The Uniting of Europe. Political, social and economical forces 1950–1957. Published under the auspices of the London Institute of World Affairs. London: Stevens, 1958. 8½″. Pp. xx + 552. 50*s*.

[To be reviewed.]

HANSEN (B.). The Economic Theory of Fiscal Policy. Translated from the Swedish by P. E. Burke. London: Allen & Unwin, 1958. 9″. Pp. xv + 450. 45*s*.

[This is a translation of a book originally published in Swedish in 1955. The Swedish edition was reviewed in the ECONOMIC JOURNAL of June 1956 by A. Williams.]

HARROD (R. F.). Policy Against Inflation. London: Macmillan, 1958. 9″. Pp. xiii + 257. 24*s*.

[To be reviewed.]

HOWARD (M.). Disengagement in Europe. A Penguin Special. Harmondsworth: Penguin Books, 1958. 7″. Pp. 92. 2*s*. 6*d*.

[This clear and well-reasoned essay is based on the deliberations of a study group of experts on military affairs. Its subject is " the military and political aspects of a military withdrawal in Central and Eastern Europe and the setting up of a neutral and demilitarised zone." This policy is considered is relation to the various alternatives that offer themselves.]

JENKS (C. W.). The Common Law of Mankind. Published under the auspices of the London Institute of World Affairs. London: Stevens, 1958. 10″. Pp. xxvi + 456. 63*s*.

[This contains a number of papers on international law. The theme running through them is that " contemporary international law can no longer be reasonably presented within the framework of the classical exposition of international law as the law governing the relations between States but must be regarded as the common law of mankind in an early stage of its development."]

MAJUMDAR (T.). The Measurement of Utility. London: Macmillan, 1958. 7½″. Pp. xiv + 149. 13*s*. 6*d*.

[Reviewed in this issue.]

MARRIS (R. L.). Economic Arithmetic. London: Macmillan, 1958. 9″. Pp. xvii + 349. 28*s*.

[To be reviewed.]

MUSGRAVE (R. A.) and PEACOCK (A. T.) for the International Economic Association. Classics in the Theory of Public Finance. London: Macmillan; New York: The Macmillan Company, 1958. 10½″. Pp. xix + 244. 30*s*.

[To be reviewed.]

NICULESCU (B.). Colonial Planning. A comparative study. London: Allen & Unwin, 1958. 9″. Pp. 208. 18*s*.

[To be reviewed.]

REDLICH (J.) and HIRST (F. W.). The History of Local Government in England. Edited by B. KEITH-LUCAS. London: Macmillan, 1958. 8½″. Pp. xv + 261. 30*s*.

[This is a reprint of the historical section of Redlich and Hirst's classic *Local Government in England*, originally published in 1903, and now out of print. The editor has added an introduction describing the context of German thinking within which Redlich's views must be judged, and he has also contributed a concluding chapter briefly setting forth the main developments in English local government since 1903.]

RYAN (W. J. L.). Price Theory. London: Macmillan, 1958. 9″. Pp. ix + 396. 31*s*. 6*d*.

[To be reviewed.]

SCITOVSKY (T.). Economic Theory and Western European Integration. London: Allen & Unwin, 1958. 9″. Pp. 154. 16*s*.

[To be reviewed.]

SHACKLE (G. L. S.) (Ed.). A New Prospect of Economics. An introductory textbook by members of the staff of the Department of Economics in the University of Liverpool, under the chairmanship of F. E. HYDE. Liverpool: Liverpool University Press, 1958. 9″. Pp. xiv + 498. 30*s*.

[To be reviewed.]

STAPLETON (G. B.). The Wealth of Nigeria. London: Oxford University Press, 1958. 7½″. Pp. ix + 228. 16*s*.

[To be reviewed.]

STEPHENS (W. B.). Seventeenth-Century Exeter. A study in industrial and commercial development, 1625–1688. A publication of the History of Exeter and South West Research Group. Exeter: University of Exeter, 1958. 9″. Pp. xxvi + 203. 30*s*.

[This elaborately documented monograph analyses the industry, trade and economic and social structure of Exeter between 1625 and 1688. A major theme is the transformation of Exeter's trade brought about by the Civil War and Interregnum, as a result of which it came to be focused mainly on Holland, Germany and Italy, instead of on France, as it had been before.]

TAWNEY (R. H.). Business and Politics under James I. Lionel Cranfield as Merchant and Minister. London: Cambridge University Press, 1958. 9½″. Pp. 325. 40*s*.

[To be reviewed.]

TITMUSS (R. M.). Essays on "The Welfare State." London: Allen & Unwin, 1958. 9″. Pp. 232. 20*s*.

[To be reviewed.]

WILLIAMS (W. M.). The Country Craftsman. A study of some rural crafts and the rural industries organisation in England. Dartington Hall Studies in Rural Sociology. London: Routledge & Kegan Paul, 1958. 9″. Pp. xviii + 214. 25*s*.

[The author's main purpose is to examine critically the policy of the complex of bodies which he describes as the rural industries organisation, financed by the Treasury, through which assistance of various sorts is given to country craftsmen. To cast light on this, he undertook field-study of the state of rural crafts in Devon and in the West Midlands. These crafts suffer not only from declining demand due to technical changes (such as the fall in the number of horses) but also from a social dilemma: they serve rural customers who are usually accustomed to long credit and a friendly personal basis of dealing, while having to obtain their supplies from urban firms which require prompt payment on strictly business terms. While not denying that certain crafts provide necessary services to agriculture, the author is inclined to scoff at some of the more romantic claims put forward about their social usefulness. He believes that crafts (as distinct from larger-scale industry) are a very small source of rural employment. Mr. Williams suggests that the rural industries organisation should now give more emphasis to improving the craftsman's efficiency in the business side of his work and less to raising technical standards. Better access to loan capital is also important. Some of the resources that the rural industries organisation has hitherto devoted to the encouragement of crafts should also in future be diverted to other rural industries.]

Australian

COOMBS (H. C.). Conditions of Monetary Policy in Australia. The R. C. Mills Memorial Lecture. Sydney: Department of Economics, University of Sydney, 1958. 8½". Pp. 40. 5*s*. (Aust.)

[The author is Governor of the Commonwealth Bank of Australia. He describes the successes and failures of monetary policy in Australia in recent years. As in other countries, the record has been a mixed one, and one of the chief difficulties has been the time needed for monetary measures to take effect. A number of interesting technical suggestions are made as to how the task of the authorities might be made easier. Dr. Coombs' lecture is preceded by a memoir of R. C. Mills by Professor S. J. Butlin.]

MATHEWS (R.) and GRANT (J. McB.). Inflation and Company Finance. Sydney: The Law Book Company of Australasia (London: Sweet & Maxwell), 1958. 8½". Pp. xii + 179. 42*s*.

[This is partly a general theoretical study and partly an analysis of Australian statistics. The authors state the case for calculating current company income after deduction of depreciation at replacement stock and stock appreciation. They analyse what difference such a procedure would have made to the figures of Australian company profits since the War. In considering the effects of current accounting practices on the position and policy of companies, they have regard not only to tax liability and investment decisions—the two most familiar aspects of the matter—but also to pricing policy and policy relating to dividend distribution.]

Canadian

CREIGHTON (D.). Harold Adams Innis. Portrait of a scholar. Toronto: University of Toronto Press, 1957 (London: Oxford University Press, 1958). 9". Pp. 146. 24*s*.

[Reviewed in this issue.]

American

BACH (G. L.). Inflation. A study in economics, ethics and politics. The Colver Lectures in Brown University, 1957. Providence, R.I.: Brown University Press, 1958. 8½". Pp. vii + 103. $2.50.

[This is a group of four lectures on the problem of inflation in the United States economy today. The first lecture contains a very compressed and useful survey of the economic effects of inflation. The author suggests that the effects of a rising price level have been a good deal less drastic either for good or evil than is commonly supposed. He enumerates next a series of reasons which lead him to believe that there will be a strong pressure towards inflation during the foreseeable future. He then turns to questions of policy. Although inflation has not caused large distributional shifts between major categories of income receivers, some groups, notably the elderly and those employed directly or indirectly by government, have undoubtedly suffered severely. Such "non-fulfilment of reasonable expectations" strikes the author as the gravest objection in equity to even a slow process of inflation. He therefore believes that, despite all the difficulties involved, the best policy is really to take the strongest possible line against inflation. Success in such a policy depends, however, on the willing participation of all major economic groups; it cannot be imposed by force. And since it would be unrealistic in present circumstances to expect complete success, an attempt should be made at the same time to lessen the evils of inflation by supporting the position of those most vulnerable to it. In particular, the Government itself should have clean hands in the matter. It is highly inequitable that government employees should suffer from the Government's attempt to "give a good example" in their case by holding down their wages, while failing to prevent a rise in wages in other sectors of the economy. Hence "governments should put all prices which they determine unilaterally on something like a cost-of-living-adjusted basis." Likewise it is wrong to perpetuate laws which oblige trustees to hold the bulk of their assets in fixed-income securities. The author is aware of the objection that such attempts to mitigate the evils of inflation might hasten its pace; but he believes that they are not inconsistent with an attempt to stop inflation by general consent. While Professor Bach is speaking all the time of the American economy, his moderate and balanced views are of much interest in the context of British problems as well.]

BOULDING (K. E.). The Skills of the Economist. Cleveland, Ohio: Howard Allen, 1957. (London: Hamish Hamilton, 1958). 8″. Pp. 193. 16*s*.

[To be reviewed.]

BOWMAN (M. J.) (Ed.). Expectations, Uncertainty, and Business Behaviour. A conference held at the Carnegie Institute of Technology in October 1955 under the auspices of the Committee on Business Enterprise Research. New York: Social Science Research Council (230 Park Avenue, New York 17), 1958. 11″. Pp. 202. $2.00.

[To be reviewed.]

COCHRANE (W. W.). Farm Prices—Myth and Reality. Minneapolis, Minnesota: University of Minnesota Press (London: Oxford University Press), 1958. 9½″. Pp. vii + 189. 32*s*.

[The author is Professor of Agricultural Economics at the University of Minnesota. His purpose is to analyse the problems of agriculture within a framework of an evolving, developing American economy. He analyses the way in which the combination of inelastic demand and expanding supply creates a chronic price problem for agriculture. On the basis of this analysis and of certain value judgments which he is at pains to formulate with unusual explicitness, he considers the relative merits of the alternative ways in which output can be kept down to the level of demand. The author does not claim to introduce any basically new concepts, though much of his statistical and descriptive material is new, but he suggests that some novelty resides in his general synthesis and his view of agriculture in the context of the economy as a whole.]

A Comprehensive Bibliography on Operations Research, through 1956, with Supplement for 1957. Publications in Operations Research, No. 4. New York: John Wiley (London: Chapman & Hall), 1958. 11″. Pp. xi + 188. 52*s*.

[This contains about 3,000 titles, arranged alphabetically by authors. A system of serial numbers helps the reader to find items on particular subjects and indicates the scope of each item. Separate listing is given of the entries relevant to each of some forty special sub-topics.]

A Critique of the United States Income and Product Accounts. Studies in Income and Wealth, Volume XXII, by the Conference on Research in Income and Wealth. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1958. 9½″. Pp. 589. 92*s*.

[This contains papers delivered at a conference held in November 1955. The volume opens with a long paper on the conceptual basis of the United States national income accounts by George Jaszi, who is head of the National Income Division of the Office of Business Economics in the Department of Commerce. There follow papers on different aspects of the accounts by economists and business users.]

EHRMANN (H. W.). Organized Business in France. Princeton, New Jersey: Princeton University Press (London: Oxford University Press), 1958. 9½″. Pp. xx + 514. 60*s*.

[To be reviewed.]

FERBER (R.). Employers' Forecasts of Manpower Requirements: A Case Study. Urbana, Illinois: Bureau of Economic and Business Research, University of Illinois, 1958. 9″. Pp. 88. $1.50.

[This is one of an interesting series of monographs on expectations emanating from the Bureau of Economic and Business Research of the University of Illinois. Data are supplied by employers in Illinois to the Illinois Department of Labour on the anticipated size of their labour force two months in advance and four months in advance. The author analyses the accuracy of these projections and considers the factors influencing them. Broadly speaking, the forecasts turned out quite well, though it has to be borne in mind that they related to the quite near future and that the period covered by the study happened to be relatively free from major fluctuations. As in a former study (on railroad shippers' forecasts), it was found that forecasts in general were of an upward movement, so that errors were larger when contractions actually eventuated than when expansion continued.]

FURNISS (E. S.). The Position of the Laborer in a System of Nationalism. A study in the labor theories of the later English Mercantilists. Reprints of Economic Classics. New York: Kelley & Millman, 1957. 8½″. Pp. 260. $6.00.

[This is a reprint of a work by Professor E. S. Furniss of Yale that was first published some forty years ago. It won high praise from Professor Heckscher as a study of a particular aspect of mercantilist thinking.]

HENDERSON (J. M.). The Efficiency of the Coal Industry. An application of linear programming. Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1958. 8½″. Pp. xii + 146. 36*s*.

[To be reviewed.]

HOUSER (T. V.). The Cruelest Tax. New York: Committee for Economic Development (711 Fifth Avenue, New York 22), 1958. 9″. Pp. 23. 50c.

[This is a summary of a report on inflation issued by the Research and Policy Committee of the Committee for Economic Development.]

JONES (R.). An Essay on the Distribution of Wealth and on the Sources of Taxation. Reprints of Economic Classics. New York: Kelley & Millman, 1956. 8½″. Pp. xlix + 329. $8.50.

[The Rev. Richard Jones (1790–1855) was an economist who asserted the importance of historical and institutional study in opposition to the deductive method of the Ricardian school. The present work is a treatment of the problem of rent along these lines. As with several of Messrs. Kelley and Millman's otherwise valuable series of reprints, the original date of publication is not indicated.]

KINDLEBERGER (C. P.). International Economics. Revised Edition. Homewood, Illinois: Irwin, 1958. 9½″. Pp. xxii + 636. $7.00.

[The first edition of this well-known text-book was reviewed by Sir Donald MacDougall in the ECONOMIC JOURNAL of September 1954, p. 559. The present edition has been considerably revised, new material has been added, and some of the more difficult analysis relegated to appendices.]

LEVIN (H. J.) (Ed.). Business Organization and Public Policy. A book of readings. New York: Rinehart, 1958. 9½″. Pp. xxi + 550.

[This is a systematically organised collection of readings in the field of industrial concentration, anti-trust policy and government intervention in industry, almost all of them taken from American sources. Each section is introduced by a few pages by the editor, in which he outlines the issues involved and reviews the literature. While the strongly American orientation limits the book's usefulness to English students, the skill with which it is put together demonstrates that such a collection of readings can cover the ground no less successfully than a pre-digested text-book and with considerably greater educational value.]

MEIER (G. M.) and BALDWIN (R. E.). Economic Development. Theory, history, policy. New York: John Wiley (London: Chapman & Hall), 1957. 9½″. Pp. xix + 588. 68*s*.

[To be reviewed.]

MYERS (C. A.). Labor Problems in the Industrialization of India. Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1958. 9½″. Pp. xvii + 297. 52*s*.

[To be reviewed.]

NATIONAL BUREAU OF ECONOMIC RESEARCH. Investing in Economic Knowledge, by S. FABRICANT. 38th Annual Report. New York: National Bureau of Economic Research, 1958. 10½″. Pp. 108.

[This report becomes a more substantial and valuable document every year. On this occasion Professor Fabricant, instead of choosing a particular topic for his introductory paper, devotes it to a general survey of the past, present and future work of the National Bureau, looked at in relation to the broad aims of economic research in furthering the national interest. The second part of the Report contains full accounts by staff members of research currently in progress, with summaries of results to date. Some of these summaries are of the dimension of short articles.]

PAPANDREOU (A. G.). Economics as a Science. Chicago, Illinois: J. B. Lippincott Company, 1958. 8½″. Pp. xi + 148.

[To be reviewed.]

ROBERTSON (H. M.). South Africa. Economic and political aspects. Durham, North Carolina: Duke University Press for the Duke University Commonwealth Studies Center (London: Cambridge University Press), 1957. 8″. Pp. x + 192. $3.50.

[The racial problem is the central theme of these informative, liberal-minded and well-reasoned lectures. Professor Robertson first describes the way in which relationships between Black and

White have developed in the course of South African history, especially in the economic sphere. He then considers the doctrine of *apartheid*, viewed in relation to past and present realities and future possibilities. He devotes much attention to the system of migrant labour, which is what makes *apartheid* at least a theoretically conceivable solution. He shows, however, that the possibility of providing for all or the bulk of the Native population in the Reserves is likely to be rendered increasingly remote by demographic trends, quite apart from the many other difficulties involved. Hence arises the danger that any potentially constructive elements in the concept of *apartheid* will be lost sight of, and it will come to be merely synonymous with repression. Professor Robertson's final lecture is concerned with recent constitutional struggles. Appended to the lectures are a glossary and an extensive annotated bibliography.]

SAULNIER (R. J.), HALCROW (H. G.) and JACOBY (N. H.). Federal Lending and Loan Insurance. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1958. 9½". Pp. xxx + 566. 96*s*.

[This is a fully documented statistical survey of the Federal Government's programme of lending and loan insurance which began in 1932 and of its consequences. This has now become a major feature of the American financial scene, especially in agriculture and housing. The authors reckon that its importance in determining the level of demand has been not less than that of Federal fiscal policy, but the two have in general not been well co-ordinated. In addition to its effects on the level of aggregate activity, lending by the Federal Government has had effects on the allocation of resources and on the distribution of income. It has had the general effect of cheapening the terms of credit required by private lenders.]

SMITH (ADAM). Lectures on Justice, Police, Revenue and Arms, delivered in the University of Glasgow. Edited by E. CANNAN. Reprints of Economic Classics. New York: Kelley & Millman, 1956. 8½". Pp. xxxix + 293. $7.50.

[The publication of these lectures in 1896 was an important event in the history of economic thought. They are now made available in this photographic reprint.]

TANNENBAUM (A. S.) and KAHN (R. L.). Participation in Union Locals. Evanston, Illinois: Row, Peterson, 1958. 8½". Pp. xii + 275.

[This is a sociological study of the sort of people who are active in unions and their motivations, and of the characteristics with respect to control and other aspects of organisation that go to make a union an active one. It is based on four case-studies. In three of the unions studied, the most active members were found to be in general those with more skilled jobs than the average, and their interest in union activities arose largely from desire to protect their job interests. They were not as a rule particularly ambitious to raise their personal status, nor were they animated by special hostility to management. In the fourth union, however, things were rather different. This was a more aggressive union, and its most active members were not those with the most valuable job interests to protect.]

DE LA VEGA (J.). Confusion de Confusiones. Portions descriptive of the Amsterdam Stock Exchange, selected and translated by H. KELLENBENZ. Boston, Mass.: The Baker Library, Harvard University Graduate School of Business Administration, 1957. 10½". Pp. 42.

[The curious work which is the subject of this latest publication in the Baker Library series of reprints was written in Spanish in 1688 by a Portuguese Jew resident in Amsterdam. Its subject is the organisation of the Amsterdam Stock Exchange and the practices in stock dealing there at that time. It is cast in the form of a dialogue, and the original was written in an extravagant style, with extensive rhetorical and literary digressions and moralisings. The translation is therefore of selected passages only and is designed to make conveniently available the remarkable amount of information that the work contains. The introduction by Professor Kellenbenz discusses de la Vega's personal history and analyses the financial institutions which his book describes.]

German

GUNSTON (C. A.) and CORNER (C. M.). Deutsch–Englisches Glossarium finanzieller und wirtschaftlicher Fachausdrücke. Dritte stark erweiterte Auflage. Frankfurt: Fritz Knapp (London: Patria Translations, 22 Cheyne Walk, Hendon Central, N.W.4), 1958. 7½". Pp. 814. 68*s*.

[This is the third edition, much enlarged, of a glossary designed principally for the use of translators employed by banks and similar institutions. It seeks to give the exact English equivalent

of technical terms in use in economic and financial literature, with explanatory notes where necessary.]

Norwegian

Bedriftsskatter i Danmark, Norge og Sverige. (Corporate Taxes in Denmark, Norway and Sweden). Samfunnsøkonomiske Studier No. 6. Oslo: Statistisk Sentralbyrå, 1958. 9½". Pp. 100.

[This is in Norwegian, with an English summary. The methods of assessing corporate tax liability in the three countries are described in detail and illustrated with reference to hypothetical examples. For the purpose of giving an overall evaluation, the concept is used of an "equilibrium tax rate," namely the rate of tax that would be payable by a company if the various factors affecting its liability had been following a smooth path for a number of years.]

Israel

The Challenge of Development. A symposium held in Jerusalem in June 1957. Jerusalem: The Eliezer Kaplan School of Economics and Social Sciences, the Hebrew University, 1958. 9½". Pp. 233. 7*s*.

[To be reviewed.]

KLINOV-MALUL (RUTH). Productivity of Labor and Machines in Israel's Cotton Spinning Mills. Jerusalem: Falk Project for Economic Research in Israel (24 Hillel Street), 1958. 9½". Pp. 48.

[The upshot of this piece of research is that productivity per man and per machine in cotton-spinning mills in Israel does not compare too unfavourably with productivity in most countries in Western Europe and South America, though falling well short of the standard in North America. Most of the equipment used in the mills in Israel is relatively modern, but as against this advantage are the disadvantages imposed by unduly small-scale production and inadequate specialisation. The higher cost of the output of Israeli mills at current exchange rates compared with the cost of European yarn is due more to differences in factor prices than to differences in productivity.]

LUBELL (H.) and others. Israel's National Expenditure 1950–54. Jerusalem: Falk Project for Economic Research in Israel and the Central Bureau of Statistics, 1958. 9½". Pp. 93. $2.00.

[This completes a series of national accounts studies for Israel undertaken by the Falk Project and the Central Bureau of Statistics for the period 1950–54. It contains the commodity flow data which add up to totals of expenditure, and it also contains a system of tables drawing together the results of the previous studies. Output and consumption per head in real terms are shown to have risen sharply in 1954, after being nearly stationary for the previous three years. Gross domestic capital formation, on the other hand, fell markedly between 1950 and 1954, mainly because of the decline in residential construction associated with the decline in the rate of immigration.]

Turkish

HABAKKUK (H. J.), SAUVY (A.), SARACENO (P.), LARY (H. B.) and NURKSE (R.). Lectures on Economic Development. Ankara: Faculty of Political Sciences, University of Ankara; Istanbul: Faculty of Economics, University of Istanbul, 1958. 9½". Pp. 200. £7.20 Turkish.

[This contains a series of lectures delivered in Istanbul and Ankara by visiting economists in Spring 1957. The contents are: "The Entrepreneur and Economic Development" and "Population Growth and Economic Development," by H. J. Habakkuk; "Progrès technique, emploi et chômage" and "La population des pays sous-développés," by A. Sauvy; "Initiative privée et action publique dans les plans d'industrialisation des régions sous-développées," by P. Saraceno; "Economic Development and the Capacity to Import: National Policies" and "Economic Development and the Capacity to Import: International Policies," by H. B. Lary; "The Conflict between 'Balanced Growth' and International Specialization" and "Some Reflections on the International Financing of Public Overhead Investments," by R. Nurkse.]

Sudanese

The Population of Sudan. Report of the Sixth Annual Conference of the Philosophical Society of Sudan in conjunction with the Department of Statistics, Government of the Republic of Sudan. Khartoum: Philosophical Society of Sudan, 1958. 11½″. Pp. 97 + maps.

[The first Census of the Sudan was recently undertaken and its results are currently in the course of preparation. The proceedings of this conference contain lectures, written contributions and maps, many of which are based on the preliminary results of the Census.]

Japanese

KIMURA (M.). Conditions for Direct Taxation and Other Essays. Science Council of Japan, Economic Series No. 17. Tokyo: Science Council of Japan, 1958. 8½″. Pp. 130.

[This is published in a series sponsored by the Social Science Council of Japan with the purpose of making the writings of Japanese economists more readily accessible to western readers. It contains six essays by Professor Kimura, most of which have been previously printed. They bear mainly on the problems of taxation that arise at different stages of economic development with especial reference to the experience of Japan.]

Official

BRITISH

PEACOCK (A. T.) and DOSSER (D. G. M.). The National Income of Tanganyika, 1952–54. Colonial Research Study, No. 26. London: H.M. Stationery Office, 1958. 9½″. Pp. 78. 7*s.* 6*d.*

[To be reviewed.]

WOODWARD (JOAN). Management and Technology. Problems of Progress in Industry, No. 3. London: H.M. Stationery Office, 1958. 8½″. Pp. 40. 2*s.* 6*d.*

[This is a summary of a research project which will be described in full in a forthcoming book. It is based on a survey of management organisation in a hundred firms in South Essex. Its main subject is the relation between technical conditions of production and organisational requirements within management. One of the conclusions reached is that the impact of technical change on organisational patterns need not be very great unless a change is involved either in aims or in the production system.]

CANADIAN

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning the Manufacture, Distribution and Sale of Yeast; Pp. 80. Report Concerning the Production, Distribution and Sale of Zinc Oxide; Pp. 193. Report Concerning the Purchase of Pulpwood in Certain Districts of East Canada; Pp. 229. Ottawa: Department of Justice, 1958. 10″. 50c. each.

[These three latest reports of the Canadian Restrictive Trade Practices Commission contain the conclusions arrived at, together, as usual, with extensive verbatim extracts from the oral evidence and exhibits received.]

ROYAL COMMISSION ON CANADA'S ECONOMIC PROSPECTS. Final Report. Ottawa: The Queen's Printer, 1957. 10″. Pp. 509.

[To be reviewed.]

AMERICAN

Statistical Review of East–West Trade 1956–57. Eleventh Report to Congress under the Mutual Defense Assistance Control Act of 1951. Washington, D.C.: U.S. Government Printing Office, 1958. 9″. Pp. 34.

[This contains statistics for 1956 and 1957, together with an account of the controls affecting trade with the communist bloc in each of the principal Western countries. The report is one of a series that appears twice a year.]

INTERNATIONAL

COUNCIL OF EUROPE. The Development of Africa. Report of the group of experts presented to the Consultative Assembly of the Council. Strasbourg: Council of Europe, 1957. 10″. Pp. 69.

[This is the report of a study group concerned with the economic development of Africa, with special reference to the contribution that may be made by the co-operation of European countries. Attention is given in particular to external finance for development, technical assistance, and the organisation of trade relations and markets, and to the institutional framework required for these purposes.]

TINBERGEN (J.). The Design of Development. Baltimore: The Johns Hopkins Press for the Economic Development Institute (International Bank for Reconstruction and Development) (London: Oxford University Press), 1958. 8½″. Pp. 99. 20*s*.

[To be reviewed.]

UNITED NATIONS. Structure and Growth of Selected African Economies. New York: United Nations, 1958. 11″. Pp. 201. 14*s*.

[The three economies considered are the Federation of Rhodesia and Nyasaland, Morocco and the Sudan. The central theme of the study is the process by which resources are transferred from unspecialised traditional subsistence agriculture to the growing exchange sector of the economy. The exchange sector may be dominated by foreign capital and enterprise, as in Rhodesia, or it may come into existence by commercialisation of parts of the traditional economy, as in the Sudan. Morocco presents a case intermediate between these two. The report analyses the structure of the three economies, and the ways in which it has been and is likely to be affected by growth. It contains extensive statistical tables, based mainly on published data but including also a certain number of new estimates.]

INTERNATIONAL MONETARY FUND. Annual Report of the Executive Directors for the Fiscal Year ended April 30, 1958. Washington, D.C.: International Monetary Fund, 1958. 9″. Pp. 218.

[This year's issue of the Fund's Annual Report follows its now established lines. It contains a general review of the world economic position, followed by a more detailed survey of developments affecting finance and balances of payments. The general introductory chapter is mainly concerned with the problems involved by recent deflationary tendencies. Its conclusion foreshadows recent moves towards increasing the Fund's resources.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Governmental Services to the Sea-fish Industry of Great Britain. Rome: F.A.O., 1958. 9″. Pp. viii + 127. 6*s*. 3*d*.

[This report was prepared under the auspices of the Royal Institute of Public Administration for the F.A.O. by F. M. G. Wilson, Research Fellow of Nuffield College. Part I contains a useful general survey of the present structure of the fishing industry in Great Britain and an analysis of the factors—depression, war, changes in demand, conservation problems—that have led to the present extensive government interest in it. Part II describes in more detail the various services rendered by the Government to the industry.]

Bankers and Pashas

DAVID S. LANDES

This fascinating study of international finance and politics in Egypt during the decade 1858–68, when the Suez Canal was under construction, is based on a newly-discovered correspondence between Alfred André, a leading international financier, and Edouard Dervieu, private banker to the Viceroy of Egypt.

'His book is a model of how history should be written: rich in detail but never losing sight of the general picture. . . . Mr Landes traces this story with easy mastery. . . . The book is salutary reading for every European.'—A. J. P. TAYLOR, *The Observer*

Economic Planning

by programme & control in Great Britain

GILBERT WALKER

Professor Walker explains the theoretical and statistical foundations upon which economic planning is built, and gives an account of how theory has been put into practice in Great Britain since the war.

'. . . lets in much valuable light upon the uses and limitations of planning. It may help to clear political minds of some obsolete prejudices.'—*Birmingham Post* 18*s*

Survey Methods in Social Investigation

C. A. MOSER

'This is the first textbook published in any country covering the whole field of social survey technique. As such it is a remarkably competent job; thorough, accurate, balanced, and very clearly written.'—*Discovery*

'. . . particularly welcome . . . clear, expert and balanced.' —*The Scotsman* 35*s*

WILLIAM HEINEMANN LTD

99 GREAT RUSSELL STREET LONDON WC1

ROYAL STATISTICAL SOCIETY

The *Journal of the Royal Statistical Society* is published in two series: SERIES A (GENERAL), four times a year, 20s. each part, annual subscription £4 4s., post free; SERIES B (METHODOLOGICAL), two issues a year, 30s. each part, annual subscription £3 2s., post free.

Volume 121, SERIES A (GENERAL) **CONTENTS** **Part 1, 1958**

Classification of the Population by Social and Economic Characteristics—The French Experience and International Recommendations. (With Discussion) . . . M. BRICHLER
Research in Statistics. (With Discussion) . . . . . M. G. KENDALL
Differential Prices for the Service of Ships Belonging to The Same General Class—A Case of Oligopoly . . . . . D. E. KOPANITSAS
The Efficiency of Randomization by Card Shuffling . D. D. KOSAMBI and U. V. RAMAMOHANA RAO
Reviews of Books, Statistical and Current Notes, Additions to Library.

Obtainable through any bookseller or direct from:

Royal Statistical Society, 21 Bentinck Street, London, W.1

ECONOMICA

Published Quarterly

38th Year: New Series, Vol. XXV, No. 100 **November, 1958**

CONTENTS

The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957 . . . . . A. W. PHILLIPS
Liquidity Preference and Loanable Funds: Stock and Flow Analysis . . . . . DON PATINKIN
Joseph Lang and Macroeconomics . . . . . R. D. THEOCHARIS
The Exchange Business of the Irish Banks in the Eighteenth Century . . . . . L. M. CULLEN
The English Capital Market Before 1914—Reply . . . . . A. R. HALL
When Are Goods More Goods? . . . . . H. A. JOHN GREEN
Robbins on Torrens . . . . . FRANK WHITSON FETTER

Annual Subscription **£1 5s. 0d.** *per annum, post free. Copies can be obtained from any bookseller or from the Publication Department of the London School of Economics, Houghton Street, London, W.C.2.*

OXFORD ECONOMIC PAPERS

New Series

Volume 10 **June, 1958** **Number 2**

The Measurement of Real Income . . . . . J. R. HICKS
Is the National Debt a Burden? . . . . . J. E. MEADE
Automatic Market Clearance and Innovations in the Theory of Employment and Growth W. FELLNER
An Integration of Employment Economics Within the Keynesian Theory of Money Flows H. VANDENBORRE
Productivity and Inflation . . . . . T. BALOGH
Prices, Productivity, and Incomes . . . . . G. D. N. WORSWICK

Oxford Economic Papers became a periodical in 1949, and is published three times a year. The pre-paid subscription price is 35s., post free, and the price of a single copy 16s. net.

OXFORD UNIVERSITY PRESS, Amen House, Warwick Square, London, E.C.4

THE REVIEW OF ECONOMIC STUDIES

VOLUME XXVI (1), NO. 69 **CONTENTS** **OCTOBER, 1958**

Monetary and Value Theory: A Critique of Lange and Patinkin G. C. ARCHIBALD and R. G. LIPSEY
The Capital Output Ratio in Japanese Economic Development . . . . . G. RANIS
Maximum Likelihood Estimation of Tornqvist Demand Equations . . . . . P. R. FISK
Marketing Board and Economic Development in Nigeria and Ghana . . . . . E. K. HAWKINS
A Single Geometric Measure of Elasticity of Demand and Supply . . . . . E. J MISHAN
A Note on Kaldor's "Speculation and Economic Stability" . . . . . PAUL STREETEN
A Comment . . . . . NICHOLAS KALDOR
Neutral Money in Patinkin's "Money Interest and Prices" . . . . . P. WONNACOTT
Consumer's Surplus and Discriminating Monopoly . . . . . ROY HOUGHTON

Annual Subscription, 21s. per Vol. (3 issues) post free. U.S.A. and Canada, $4 per Vol. Back number rates on application to Secretary.

With Vol. XXVI (1), the Review reverted to three issues per volume. The new subscription rates appear above. Editorial communications should be sent to the Editor, Review of Economic Studies, Nuffield College, Oxford. Articles from the U.S.A. and Canada should be sent to P. A. Samuelson, Massachusetts Institute of Technology, Cambridge, Mass. All other communications to the Secretary, Review of Economic Studies, 7 West Road, Cambridge, England. Cheques should be made payable to the Review of Economic Studies.

THE AGRICULTURAL HISTORY REVIEW

the Journal of the British Agricultural History Society

Edited by H. P. R. FINBERG

Volume VI, Part — **September, 1958**

Agriculture in Roman Britain . . . . . S. APPLEBAUM
The East Anglian Foldcourse . . . . . ALAN SIMPSON
The Lost Village and the Landscape of the Yorkshire Wolds . . . . . ALAN HARRIS
Work in Progress . . . . . Compiled by JOAN THIRSK
List of Members of the British Agricultural History Society
Book Reviews; Notes and Comments; Letters to the Editor

The price of a single copy of the Review which is published twice a year is 12*s.* 6*d. The annual subscription to the Society is one guinea. Copies of the Review or details of the Society may be obtained from the Secretary, J. W. Y. Higgs, The British Agricultural History Society, c/o University of Oxford Department of Agriculture, Parks Road, Oxford.*

POPULATION STUDIES

A JOURNAL OF DEMOGRAPHY

Edited by D. V. GLASS and E. GREBENIK

VOLUME XII, NO. 1 — **CONTENTS** — **JULY, 1958**

The Reproduction Rate in Latin America: Levels, Differentials and Trends . T. LYNN SMITH
A Fertility Analysis of New Zealand Marriage Cohorts . . . . . E. G. JACOBY
Reproductive Histories of Chinese Women in Rural Taiwan . . . . . CHI-HSIEN TUAN
The Distribution of Births in Human Populations . . . . . W. BRASS
The Role of the Foreign-Language Press in Migrant Integration . . . . . JERZY ZUBRZYCKI
Book Reviews

Subscription price per volume of 3 parts 42*s.* net, post free (or American currency $6.75).
Single parts £1 each plus postage (American $3.25, post free).

Published by the Population Investigation Committee, at the London School of Economics and Political Science, 15 Houghton Street, London, W.C.2

OCCUPATIONAL PSYCHOLOGY

Editor: Alec Rodger

OCTOBER, 1958 — **VOLUME 32, NO. 4**

Discourse of Pope Pius XII to the Thirteenth International Congress of Applied Psychology.
The Study of Certain Subjective Assessments Important in Animal Improvement D. P. GATHERUM, G. HARRINGTON and R. W. POMEROY
Diagnostic (Trouble-Shooting) Skills and Their Evaluation . . . . . MURRAY GLANZER
Learning Perceptual Skills: the Sergeant System of Recognition Training . . M. D. ALLAN
The Influence of Length of Task on Rate of Work and Level of Muscular Tension . D. W. FORREST
Recent Experimental Work in the Study of Fatigue . . . . . D. C. FRASER
Early Days in Industrial Psychology: An Autobiographical Note . . . . . ERIC FARMER
Book Reviews
Other Books Received
Index

Annual Subscription 40 shillings

National Institute of Industrial Psychology, 14 Welbeck Street, London, W.1.

Scottish Journal of Political Economy

The Journal of the Scottish Economic Society

VOLUME V — **OCTOBER, 1958** — **NUMBER 3**

ARTICLES
Concentration in Selected Industries . . . . . P. E. HART
Monetary Policy and the Scottish Banks . . . . . M. GASKIN
The Union of the Crowns in 1603 and the Debate on Economic Integration . . S. G. E. LYTHE
Actual and Implied Exchange Rates . . . . . K. ROTHSCHILD
The Economy of Northern Ireland . . . . . A. D. CAMPBELL
RECENT ECONOMIC TRENDS
Production and Employment in Scotland . . . . . A. K. CAIRNCROSS
CURRENT TOPICS

The **Scottish Journal of Political Economy** is published in February, June, and October, and is free to members of the Scottish Economic Society. Applications for membership should be made to the Treasurer, Scottish Economic Society, 142 St. Vincent Street, Glasgow, C.2, enclosing the annual subscription of £1 5*s.* 0*d.* The Journal may also be obtained by non-members of the Society by ordering through any bookseller or direct from the publisher, Oliver & Boyd, Tweeddale Court, Edinburgh, price 10*s.* per single copy.

THE ECONOMIC RECORD

The Journal of the Economic Society of Australia and New Zealand

VOL. XXXIV — **AUGUST, 1958** — **No. 68**

The Australian Economy, July, 1958 . . . . . D. COCHRANE

ARTICLES:

Australia and European Free Trade . . . . . W. M. CORDEN
Trade and Redistribution of Income—Is There Still an Australian Case? . . . A. J. REITSMA
Economic Experiments in New Zealand and Their Political Background . . . K. A. BLAKEY
The Growth of the Cement Industry in the 1920's: A Study in Competition . . . C. FORSTER
The Pattern of Australian Demand . . . . . C. E. V. LESER
Capital, Income and Output in New Zealand Agriculture, 1922–1956 B. D. PHILPOTT and J. D. STEWART
Another Look at the Acceleration Relationship and Equilibrium Growth . . . R. HIEBER

NOTES:

Professor Hicks' Theory of Investment and Post-war Investment Figures in Australia and the United States . . . . . J. W. NEVILE
Some Statistics of Security Prices and Yields in the Sydney Market, 1875–1955 . D. MCL. LAMBERTON
The Relationship between Size of Families and Incomes in New Zealand, 1949–50 to 1953–54 W. ROSENBERG
Economic Principles of Transport Regulation . . . . . H. KOLIEN
Those Elementary Theorems in the Pure Theory of Price . . . . . C. S. SOPER

REVIEWS

Annual Subscription £2 0s. 0d. Published three times a year. Single Copies 13s. 6d.

Melbourne University Press, The University, Melbourne, N.3, Victoria, Australia

Registered in Australia for transmission by post as a periodical.

THE CANADIAN JOURNAL OF ECONOMICS & POLITICAL SCIENCE

The Quarterly Journal of the Canadian Political Science Association

Volume XXIV, No. 4 — **November, 1958**

The Impersonal Market . . . . . G. A. ELLIOTT
The Political Economics of the Bank of Canada . . . . H. S. GORDON and L. M. READ
Higher Public Servants and the Bureaucratic Elite in Canada . . . . JOHN PORTER
Administrative Decision and the Law: The Views of a Lawyer . . . . JOHN WILLIS
Administrative Decision and the Law: The Views of an Administrator . . . H. F. ANGUS
The Construction and Use of an Occupational Class Scale . . . . BERNARD R. BLISHEN
Language Differences and Occupational Experience . . . . . E. JACQUES BRAZEAU
The Market for Books in Canada . . . . . J. N. WOLFE
Sir Halford Mackinder: Theorist of Imperialism . . . . . BERNARD SEMMEL
Some Implications of Economic Change in Northern Ojibwa Social Structure . R. W. DUNNING

CURRENT TOPICS

REVIEW ARTICLE:

The Economics of Under Developed Countries . . . . . BENJAMIN HIGGINS

Reviews of Books

$6.00 per year. $1.50 per single issue

UNIVERSITY OF TORONTO PRESS, 33 St. George Street, Toronto 5, Canada

INDIAN JOURNAL OF ECONOMICS

Vol. XXXVIII, No. 148 — *Editor:* DR. OM PRAKASH — **JULY, 1957**

SPECIAL NUMBER ON INTERNATIONAL ECONOMIC PROBLEMS

ARTICLES:

Symposium of Economic Development . . . . . OM PRAKASH
An International Economic Policy . . . . . J. TINBERGEN
Some Reflections on the Concept of "Disguised Unemployment" . . . . JACOB VINER
Defects in the Concept of Regionalism to Solve Trading Problems . . . GOTTFRIED HABERLER
Partial vs. General Equilibrium in International Trade . . . . . C. P. KINDLEBERGER
Discriminatory Tariff Reduction: A Marshallian Analysis . . . . . HARRY G. JOHNSON
Future of World Trade . . . . . S. L. PARMAR
Overseas Borrowing: The New Model . . . . . H. W. ARNDT
Money and Banking Problems in the British Colonies . . . . . A. HASIB
Some Aspects of Fiscal Policy in Underdeveloped Economies . . . . . B. K. SINGH
The Problem of Factor Proportions in Underdeveloped Economies . . . . A. D. SHARMA
Revealed Preference for Indian Jute . . . . . GEORGE K. CHACKO

ECONOMIC LITERATURE

Annual Subscription (four issues) Rs. 17, 26 shillings or $3.80. This Special Number costs Rs. 6.50, 10 shillings or $1.50 up to December 31, 1958; and Rs. 8, 12s. 6d. or $1.80 thereafter.

Write to the Managing Editor, Indian Journal of Economics, University of Allahabad, Allahabad-2 (India).

Issued by **The Department of Economics and Commerce, University of Allahabad (India)**

WILLIAM DAWSON & SONS, LONDON

THE INDIAN ECONOMIC JOURNAL

The Quarterly Journal of the Indian Economic Association

Edited by C. N. VAKIL, R. BALAKRISHNA, P. R. BRAHMANAND

No. 1, JULY 1958 — **Vol. VI**

A Re-evaluation of the Scarcity Postulate in the Light of Recent Theoretical Developments in the Social Sciences . . . . . M. E. POLAKOFF
Taxation in a Developing Economy with Special Reference to the Indian Plans . M. H. GOPAL
Contemporary Trends in European Co-operative Banking . . . . . K. V. SRI RAM
On the Relevance of the Sectoral Concept in the Theory of Economic Development JATI KUMAR SENGUPTA
Professor Gadgil on Rephasing the Plan—a Reply . . . . . B. R. SHENOY
Plurality as Underdevelopment . . . . . R. K. HAZARI
Locational Industrial Matrix in Economic Planning . . . . . S. S. WAGLE

Membership Fee: Rs. 15 *per year. Annual Subscription:* Rs. 15 or £1 5s. or $4.00 *inclusive of postage.*

Single Copy: Rs. 5 or 7s. 6d. or $1.25 *post free.*

"The Indian Economic Journal," Department of Economics, University of Bombay, Bombay 1 (India)

ECONOMIA INTERNAZIONALE

VOLUME XI, NO. 2 — QUARTERLY REVIEW — MAY, 1958

CONTENTS

Consumer Sovereignty and the Rate of Economic Development . . . . . F. D. HOLZMAN
Wirtschaftswachstum und Zahlungbilanz . . . . . D. SCHMIDT
Una nota critica sul modello del piano decennale . . . . . G. C. CARLUCCI
Myrdal on Commercial Policy of Underdeveloped Countries . . . . . G. M. MEIER
Principali caratteristiche strutturali di due economie mediterranee: Spagna e Italia . V. CAO-PINNA
Aspetti e problemi fiscali del M.E.C. con particolare riguardo alla diversa struttura della pubblica finanza dei paesi aderenti . . . . . V. DE NARDO
Bollettino Bibliografico ed Emerografico: Book Reviews—Titles of articles on recent periodicals. Summary of articles issued on recent periodicals.

Annual subscription to " ECONOMIA INTERNAZIONALE " It. Liras 5.000. Applications for subscription and correspondence should be addressed to the Direzione Istituto di Economia Internazionale, via Garibaldi 4, Genova (Italy).

KYKLOS

International Review for Social Sciences

Vol. XI, 1958, Fasc. 4

Public Bureaucracy, Resource Structure, and Economic Development: A Note . . JOSEPH J. SPENGLER
Wages and Aggregate Employment . . . . . FRANZ GEHRELS
The Means of Competition at Various Stages of Production and Distribution . . GÖSTA MICKWITZ
The Elimination of War—Princeton's New Approach . . . . . C. A. W. MANNING
Economic Science . . . . . ROBERT DORFMAN
A Survey of Recent Contributions to the Economics of Development . . . . . A. BONNÉ
Common Frontiers of the Social Sciences . . . . . THOMAS J. PRESELY
Book Reviews—Titles of New Books

All articles are followed by a summary in English, French and German.
Published quarterly. Annual subscription Sw.Fr. 26.00 (U.S. $6.00), postage included.

Order from your bookstore or the publisher:

KYKLOS-VERLAG, POSTFACH 20 365, BASEL 2, SWITZERLAND

PUBLIC FINANCE/FINANCES PUBLIQUES

International quarterly journal devoted to the study of fiscal policy and related problems

Publisher and Editor in Chief, Dr. J. A. Monod de Froideville, Emmalaan 2, Haarlem, Netherlands

Volume XIII, 1958 — **No. 3**

Fiscal Problems of the European Economic Community . . . . . CESARE COSCIANI
An Application of Linear Programming to Public Finance . . . . . ITALO CUTOLO
Tax System and Development of the Sahara . . . . . P. FONTANEAU
Foreign Aid and the U.S. Economy, 1948–1955 . . . N. K. CHOUDRY, S. SONENBLUM, H. E. STRINER
The " Taxation " Effects of Alternative Techniques for Trade Protection . . . . ROBERT SOLOW
Book Reviews

Contributions in French or German are followed by an English summary.
Subscription price £3 14*s.* 0*d.*

All information needed and complementary copies will be supplied by our representatives:

EMGEE FOREIGN PUBLICATIONS, 16 Red Lion Square, London, W.C.2

METROECONOMICA

INTERNATIONAL REVIEW OF ECONOMICS

VOLUME X, NO. 3 — **1958**

Histoire de l'économie mathématique jusqu'à Cournot . . . . . G. H. BOUSQUET
The valuation of random income streams . . . . . A. ROY
Macrodynamic policy making . . . . . J. BOGAARD and H. THEIL
The aggregate supply function . . . . . A. MARTY
A restatement of the conditions for identifiability in complete systems of linear equations H. A. KOOPMANS

Board of Editors: C. Bresciani Turroni, L. Dupriez, E. Fossati (*Managing Editor*), R. Frisch, W. Leontief, G. Lutfalla, A. Mahr, J. Marschak, G. U. Papi, R. Roy, E. Schneider, G. L. S. Shackle, R. Stone, J. Tinbergen, G. Tintner, F. Zeuthen.

Published every four months. Subscription rate $7 per year (two years $12). Communications to the editor to be addressed to *Professor Eraldo Fossati*, director of the *Laboratorio de economia Vilfredo Pareto, Università, Genova (Italy)*. Communications regarding subscriptions should be sent to Licinio Cappelli, Corso 12, Trieste, or G. E. Stechert-Hafner Inc., 31 *East Tenth Street, New York* 3, *N.Y., U.S.A.*

ECONOMETRICA

JOURNAL OF THE ECONOMETRIC SOCIETY

Vol. 26, No. 3, July, 1958

The Role of the Econometrician in the Advancement of Economic Theory . . TRYGVE HAAVELMO
Prices, Interest and Profits in a Dynamic Leontief System . . . . . MICHIO MORISHIMA
The Instability of Leontief Dynamic Models . . . . . J. D. SARGAN
The Estimation of Economic Relationships Using Instrumental Variables . . . J. D. SARGAN
An Econometric Analysis of the Import Function for Burlap in the USA . . . NANDA K. CHOUDHRY
A Note on the Useful Properties of Mr. Stuvel's Index Numbers . . . . . J. VAN YZEREN
Stochastic Choice and Cardinal Utility . . . . . GERARD DEBREU
A Note on the Stability of an Economy Where All Goods are Gross Substitutes . TAKASHI NEGISHI
A Note on Dynamic Stability . . . . . KENNETH J. ARROW and MAURICE MCMANUS
Report of the Luxembourg Meetings
Report of the Philadelphia Meetings

Subscription to Non-Members: $10.00 per year.

Subscriptions to **Econometrica** and inquiries about the work of the Society and the procedure for applying for membership, should be addressed to Richard Ruggles, Secretary, The Econometric Society, Box 1264, Yale University, New Haven, Connecticut.

THE QUARTERLY JOURNAL OF ECONOMICS

Vol. LXXII **FOUNDED, 1886** **November, 1958, No. 4**

Traffic Safety From an Economist's Point of View . . . . . STEFAN VALAVANIS
Accelerated Investment as a Force in Economic Development . . . . . HOWARD S. ELLIS
An Economic Justification of Protectionism . . . . . EVERETT E. HAGEN
A Study of Decision-making Within the Firm . . . . EDWIN MANSFIELD and HAROLD H. WEIN
The Place of Money Capital on the Theory of Production . . ANDRE GABOR and I. F. PEARCE
Controlling Consumers in the Event of Future Wars . . . . . STEPHEN ENKE
Commercialism and Economic Nationalism . . . . . FRANK H. GOLAY
Unity in the Thought of Alfred Marshall . . . . . G. PURSELL
Recent Publications

Edited by Arthur Smithies for the Department of Economics, Harvard University

$1.50 per copy; $5.00 a year; 3 years, $14.00; Special Student Rate, $3.00 a year

Order from The Harvard University Press,
Cambridge 38, Massachusetts

THE JOURNAL OF POLITICAL ECONOMY

Edited by Earl J. Hamilton

The October 1958 issue contains:

Monetary Reform and Monetary Equilibrium . . . . . BORIS P. PESEK
Economies of Scale in Financial Enterprises . . . . . ROY J. HENSLEY
A Theory of Foreign-exchange Speculation under a Floating Exchange System . S. C. THANG
Research Costs and Social Returns: Hybrid Corn and Related Innovations . . ZVI GRILICHES
An Economic Analysis of Contributions under the Income Tax Laws . . . . . FLOYD E. GILLIS and VERNON L. SMITH
The Economics of Slavery in the Ante Bellum South: A Comment . . . . . DOUGLAS F. DOWD
Reply . . . . . ALFRED H. CONRAD and JOHN R. MEYER
The Corporate Income Tax in the Long Run: A Comment . . . . . ARNOLD ZELLNER
Reply . . . . . M. A. ADELMAN
Rejoinder . . . . . ARNOLD ZELLNER
Book Reviews and Books Received

FOUNDED IN 1892. Published bi-monthly: February, April, June, August, October, December. Subscription rate for U.S.A. and possessions, $6.00 per volume; for Canada and Pan American Postal Union, $6.50; for all other countries, $7.00. Single copies, $1.75. Special rates: $5.00 per volume for faculty members teaching business or economics. $3.00 per volume for graduate students in business or economics.

The University of Chicago Press—5750 Ellis Avenue, Chicago 37, Ill.

THE AMERICAN ECONOMIC REVIEW

ARTICLES **VOLUME XLVIII, NUMBER 4** **SEPTEMBER, 1958**

Soviet and American Inventory-Output Ratios . . . . . H. W. CAMPBELL
The Firm in Illyria: Market Syndicalism . . . . . BENJAMIN WARD
Progressive Taxation in an Inflationary Economy . . E. J. MISHAN and L. A. DICKS-MIREAUX
The Size Distribution of Business Firms . . . . . H. A. SIMON and C. P. BONINI
The Constancy of Relative Shares . . . . . R. M. SOLOW
Economic Problems in Air Force Logistics . . . . . HORST MENDERSHAUSEN

COMMUNICATIONS

Consumer Loans and General Credit Conditions . . . . . PAUL SMITH
The Income Tax and Deductible Costs . . . . . J. N. MORGAN
Korea's Monetary and Fiscal Systems:
Comment . . . . . LOUIS DE ALESSI and ROBERT EVANS
Comment . . . . . SEI-YOUNG PARK
Reply . . . . . C. D. CAMPBELL and GORDON TULLOCK
The Tax Element in Soviet Bonds:
Comment . . . . . MORRIS BORNSTEIN
Reply . . . . . F. D. HOLZMAN

The **American Economic Review**, a quarterly, is the official publication of the American Economic Association and is sent to all members. The annual dues are six dollars. Address editorial communications to Dr. Bernard F. Haley, Editor, **American Economic Review**, Stanford University, Stanford, California. For information concerning other publications and activities of the Association, communicate with the Secretary-Treasurer, Dr. James Washington Bell, American Economic Association, Northwestern University, Evanston, Illinois. Send for information booklet.

INTERNATIONAL ECONOMIC PAPERS

Translations prepared for the International Economic Association

No. 8

CONTENTS

Preface on the Doctrine of the Physiocrats . . . . . FRANCESCO FERRARA
Fisiocrati, 1850

The Stability of Economic Growth . . . . . ERIK LUNDBERG
Ekonomisk Tidskrift, 1

Price Discrimination in an Arbitrarily Divided Market . . . . . HEINRICH VON STACKELBERG
Archiv für mathematische Wirtschafts- und Sozialforschung, 1939

On the Aggregation of Production Functions . . . . . RAGNAR BENTZEL
25 *Economic Essays in Honour of Erik Lindahl*, 1956

The Role of the Banking System in a Macro-economic Model . . . . . LEIF JOHANSEN
Statsøkonomisk Tidsskrift, 1956

Income and Income Distribution in Macro-economic Theory . . . . . ERICH SCHNEIDER
Industria, 1957

An Index of the Size of Industrial Establishments . . . . . JÜRG NIEHANS
Zeitschrift für die gesamte Staatswissenschaft, 1955

Location Theory and Trade Policy . . . . . ALFRED WEBER
Archiv für Sozialwissenschaft und Sozialpolitik, 1911

Self-financed Multiterritorial Units and their Time Horizon . . . . . MAURICE BYÉ
Revue d'Economie Politique, 1957

Critical Comments on the Use of the Gross Production Index . . . . . RUMEN JANAKIEFF
Statistische Praxis, 1957

Money in Socialism . . . . . STEFAN VARGA
Weltwirtschaftliches Archiv, 1957

Index of I.E.P., Volumes 1–8

London 1958 **New York**

MACMILLAN & CO. LTD. **THE MACMILLAN COMPANY**

REVUE DE SCIENCE FINANCIÈRE

The French Review of Public Finance

NUMBER 1, 1959

The French Fiscal System: Original Features and Weaknesses . . . H. LAUFENBURGER
Economic Policy and National Income Measurement with special Reference to Less-developed Countries . . . . . A. T. PEACOCK (EDINBURGH)
Fiscal Policy: its Substance and Significance . . . . . A. BARRÈRE (PARIS)
Social Accounting on a Regional Basis . . . . . J. MÉRIGOT (BORDEAUX)
Corporate Taxation: when a Corporation Purchases its Own Stock . . D. BOMPIS (PARIS)
Tax Problems in the Common Market . . . . . P. KERLEN (PARIS)
Survey of French Finance
Economic Survey of French Overseas Territories
Book Reviews
Bibliography
French and International Financial Documents

The *Review* is published quarterly. Yearly subscription abroad 4.000 French francs or 9.50 U.S.A. dollars. Orders can be placed to Pichon and Durand-Auzias, 20, rue Soufflot, Paris (V°), and through Stechert-Hafner, 31 East 10th Street, New York, N.Y.

ECONOMIE APPLIQUÉE

Archives de l'Institut de Science Economique Appliquée

(The French Journal of Economic Science)

Directeur: FRANÇOIS PERROUX, *Secrétaire Général:* H. BONJOUR, I.S.E.A., 35 Boulevard des Capucines, Paris 2ème

VOLUME XI, NO. 4 **THÉORIE MONÉTAIRE—II** **OCTOBRE–DÉCEMBRE, 1958**

La part des phénomènes monétaires dans le modèle de Keynes et dans les modèles de comptabilité économique (préface de Cl. Gruson) . . . . . J. DENIZET
Les idées monétaires depuis 1945 . . . . . L. GANGHIN
Réflexions sur la zone sterling . . . . . R. HIGONNET
Quelques aspects de la politique d'aménagement du territoire (Cahier 70) . . . . . M. PENOUIL
L'exploration commerciale (Cahier 71) . . . . . S. WICKAM, E. DEUTSCH, J. MONTEL
Contributions à l'étude de l'économie européenne (Cahier Série R, No. 3) R. TRIFFIN, J. DEMYTTERE, J. P. HAYES, J. K. WRIGHT
Cybernétique et Economie (Cahier Série N, No. 2) L. COUFFIGNAL, D. ET A. GABOR, C. B. GIBBS, A. W. PHILIPS

INDEX TO THE ECONOMIC JOURNAL

VOLUME LXVIII

ARTICLES

	PAGE
Alexander, S. S., Rate of Change Approaches to Forecasting: Diffusion Indexes and First Differences	288
Ara, K., Capital Theory and Economic Growth	511
Balogh, T., Differential Profits Tax	528
Baumol, W. J., The Cardinal Utility which is Ordinal	665
Black, J., A Note on the Economics of National Superannuation	338
Broster, E. J., An Economic Analysis of Fixed Investment	768
Brown, A. J., Inflation and the British Economy	449
Busschau, W. J., Bank Credit and Gold in the United Kingdom	271
Carr-Saunders, Sir A., The Place of Economics and Allied Subjects in the Curriculum	433
Champernowne, D. G., Capital Accumulation and the Maintenance of Full Employment	211
Eisner, R., On Growth Models and the Neo-Classical Resurgence	707
Haddy, P., and Currell, M. E., British Inter-Industrial Earnings Differentials, 1924–1955	104
Hague, D. C., Alfred Marshall and the Competitive Firm	673
Harris, S. E., The 1957 Investigation of the Financial Condition of the United States	60
Harrod, R. F., Europe and the Money Muddle	534
Harrod, R. F., Factor–Price Relations Under Free Trade	245
Hemming, M. F. W., and Corden, W. M., Import Restriction as an Instrument of Balance-of-payments Policy	483
Horvat, B., The Optimum Rate of Investment	747
Hunter, A., Notes on Countervailing Power	89
Kurihara, K. K., Professor Hansen on America's Economic Revolution	471
Lancaster, K., Welfare Propositions in Terms of Consistency and Expanded Choice	464
Liesner, H. H., The European Common Market and British Industry	302
Macfie, A. L., On Psychological Treatment for the Classics	25
Machlup, F., Equilibrium and Disequilibrium: Misplaced Concreteness and Disguised Politics	1
Maxwell, J. A., Some Marshallian Concepts, Especially the Representative Firm	691
Maynard, G., Inflation, the Terms of Trade and the Share of Wages in National Income	737
Michaely, M., Concentration of Exports and Imports: An International Comparison	722
Myint, H., The "Classical Theory" of International Trade and the Underdeveloped Countries	317
Neisser, H., A Pyrrhic Victory	699
Ponsonby, G. J., The Problem of the Peak, with Special Reference to Road Passenger Transport	74

ARTICLES (*Continued*)

Power, J. H., The Economic Framework of a Theory of Growth 34

Stone, J. R. N., and Rowe, D. A., Dynamic Demand Functions: Some Econometric Results 256

White, W. H., The Rate of Interest, the Marginal Efficiency of Capital and Investment Programming 51

REVIEWS

Abbott, L., *Quality and Competition*. By A. Silberston 796

Allen, G. C., *Japan's Economic Recovery*. By W. J. Macpherson 574

Allen, G. C., and Donnithorne, A. G., *Western Enterprise in Indonesia and Malaya*. By T. H. Silcock 141

Allen, R. G. D., *Mathematical Economics*. By C. F. Carter 112

Aubrey, H. G., *United States Imports and World Trade*. By H. H. Liesner 556

Beach, E. F., *Economic Models*. By L. R. Klein 547

Birnie, A., *A Short Economic History of the United States*. By F. Thistlethwaite 145

Boulding, K. E., *The Image*. By G. L. S. Shackle 361

Le Bourva, J., *L'Inflation Française d'Après Guerre, 1945–1949*. By A. J. Brown 792

Carter, C. F., and Williams, B. R., *Industry and Technical Progress*. By D. C. Hague ... 366

Chamberlin, E. H., *Towards a More General Theory of Value*. By J. E. Meade 541

Clark, C., *The Conditions of Economic Progress (3rd Edition)*. By P. M. Deane 370

Clay, Sir H., *Lord Norman*. By R. S. Sayers... 353

Clegg, H. A., and Adams, R., *The Employers' Challenge*. By H. S. Kirkaldy 565

Clegg, H. A., and Chester, T. E., *Wage Policy and the Health Service*. By C. W. Guillebaud 126

Clements, R. V., *Managers*. By C. Erickson... 806

Cohen, J. B., *Japan's Postwar Economy*. By W. J. Macpherson 574

Consumer Instalment Credit. By J. R. Cuthbertson 121

Co-operative Independent Commission Report. By P. Sargant Florence... 563

Copland, D. B., and Barback, R. H. (Eds.), *The Conflict of Expansion and Stability*. By W. Prest 558

Cotgrove, S. F., *Technical Education and Social Change*. By J. E. Vaizey 804

Creighton, D., *Harold Adams Innis*. By C. R. Fay 822

Davison, J. P., Sargant Florence, P., Gray, B. and Ross, N. S., *Productivity and Economic Incentives*. By H. S. Kirkaldy 801

Denman, D. R., *Estate Capital*. By R. Turvey 385

Edding, F., *Internationale Tendenzen in der Entwicklung der Ausgaben für Schulen und Hochschulen*. By J. E. Vaizey... 804

Erickson, C., *American Industry and the European Immigrant, 1860–1885*. By F. Thistlethwaite 373

Fain, J. T., *Ruskin and the Economists*. By A. Briggs... 391

Farmer, B. H., *Pioneer Peasant Colonization in Ceylon*. By D. Warriner 143

Fawzi, Saad ed Din, *The Labour Movement in the Sudan, 1946–1955*. By J. H. Richardson... 380

Fellner, W., *Trends and Cycles in Economic Activity*. By R. M. Goodwin 116

Fossati, E., *Œconomica Varia*. By C. W. Guillebaud... 549

Frankel, M., *British and American Manufacturing Productivity*. By J. H. Dunning 368

Freeman, T. W., *Pre-famine Ireland*. By J. E. Vaizey 820

REVIEWS (*continued*)

Gabillard, J., *La Fin de l'Inflation*. By A. J. Brown... 792
Graaff, J. de V., *Theoretical Welfare Economics*. By P. Samuelson... 539
Grebler, L., Blank, D. M. and Winnick L., *Capital Formation in Residential Real Estate*. By I. Bowen 384
Grondona, L. St. C., *Utilizing World Abundance*. By J. E. Meade... 550
Guillebaud, C. W., *The Wages Councils System in Great Britain*. By H. A. Turner... ... 376
Haber, L. F., *The Chemical Industry During the Nineteenth Century*. By C. Wilson 811
Hague, D. C., *The Economics of Man-made Fibres*. By A. Silberston... 813
Hague, D. C. (Ed.), *Stability and Progress in the World Economy*. By U. K. Hicks 824
Harrod, R. F., *Foundations of Inductive Logic*. By R. B. Braithwaite... 146
Harrod, R. F., *International Economics (4th Edition)*. By J. E. Meade 365
Hill, P., *The Gold Coast Cocoa Farmer*. By K. D. S. Baldwin... 387
Hugh-Jones, E. M. (Ed.), *Human Relations and Modern Management*. By H. S. Kirkaldy... 802
Implications of Technical Change in Agriculture. By E. M. H. Lloyd... 135
Innis, H. A., *Essays in Canadian Economic History*. By A. J. Youngson 569
International Economic Papers, No. 7. By K. Lancaster 794
Isard, W., *Location and Space-Economy*. By F. H. Hahn 363
Jenks, C. W., *The International Protection of Trade Union Freedom*. By H. S. Kirkaldy ... 133
Jewkes, J., Sawers, D., and Stillerman, R., *The Sources of Invention*. By G. C. Allen ... 554
Jones, F. C., *Hokkaido*. By W. J. Macpherson 574
Jones, P. de A., *An Economic History of the United States Since 1783*. By F. Thistlethwaite... 145
Knight, F. H., *The History and Method of Economics*. By A. L. Macfie 780
Lamer, M., *The World Fertilizer Economy*. By G. R. Allen... 139
Lundberg, E., *Business Cycles and Economic Policy*. By J. C. R. Dow... 359
Majumdar, T., *The Measurement of Utility*. By E. J. Mishan 786
Makower, H., *Activity Analysis and the Theory of Economic Equilibrium*. By M. J. Farrell... 545
Martin, J. P., *Social Aspects of Prescribing*. By C. W. Guillebaud... 128
Meade, J. E., *The Control of Inflation*. By P. Bareau... 790
The Measurement and Behaviour of Unemployment. By H. A. Turner... 378
Ramsay, G. D., *English Overseas Trade during the Centuries of Emergence*. By A. J. Youngson 389
Regional Income. By P. M. Deane 560
Report of H.R.H. The Duke of Edinburgh's Study Conference. By H. S. Kirkaldy 130
Roll, E., *The Combined Food Board*. By G. E. F. Chilver 571
Sargent, J. R., *British Transport Policy*. By M. Beesley 561
Savage, C. I., *Inland Transport*. By G. Walker 817
Sayers, R. S., *Central Banking after Bagehot*. By R. F. Henderson 114
Sayers, R. S., *Lloyds Bank in the History of English Banking*. By Sir R. Hawtrey 357
Schouten, D. B. J., *Exakte ekonomie*. By J. S. Cramer 546
Self, P., *Cities in Flood*. By P. Sargant Florence 382
Sen, S. R., *The Economics of Sir James Steuart*. By A. J. Youngson... 120
Shackle, G. L. S., *Time in Economics*. By C. F. Carter 543
Shiomi, S., *Japan's Finance and Taxation, 1940–56*. W. J. Macpherson 574

REVIEWS (*continued*)

Soth, L., *Farm Trouble*. By M. Gertler 136
Soule, G., and Carosso, V. P., *American Economic History*. By F. Thistlethwaite 145
Sovetskaya Sotsialischicheskaya Ekonomika 1917–1957. By A. D. Nove 577
Steiner, P. O., and Dorfman, R., *The Economic Status of the Aged*. By D. E. Cole... ... 124
Strauss, E., *Common Sense about the Common Market*. By B. Tew 799
Sturmey, S. G., *The Economic Development of Radio*. By J. H. Dunning 815
Technical Change and Industrial Relations. By A. Beacham 131
Townsend, P., *The Family Life of Old People*. By D. E. Cole 567
Triffin, R., *Europe and the Money Muddle*. By R. F. Harrod... 534
Twenty-five Economic Essays in Honour of Erik Lindahl. By B. Thomas 116
Vaizey, J. E., *The Costs of Education*. By H. Marquand 809
Weisskopf, W. A., *The Psychology of Economics*. By A. L. Macfie 25
Williams, E. W., *The Regulation of Rail–Motor Rate Competition*. By G. Walker 819
Williams, G., *Recruitment to Skilled Trades*. By H. S. Kirkaldy 375
Womanpower. By B. N. Seear 808

NOTES AND MEMORANDA

Bhatt, V. V., Techniques, Employment and Rate of Growth 581
Burton, H., Import Duties and the Gross Domestic Product at Market Prices: A Rejoinder 585
Davis, R. G., Comment on Arrow and the "New Welfare" Economics 834
Encarnación, J., Consistency Between Say's Identity and the Cambridge Equations ... 827
Ford, A. G., Capital Exports and Growth for Argentina, 1880–1914 589
Horvat, B., The Optimum Rate of Saving: A Note... 157
Lamberton, D. M., New Measures of the Growth of Firms: A Comment... 593
Mishan, E. J., Arrow and the "New Welfare" Economics: A Restatement 595
Moos, S., The Scope of Automation... 158
Neiser, H., The Supply Factor in the Theory of the Cycle: Some Comments 150
Nicholson, J. L., Import Duties and the Gross Domestic Product at Market Prices ... 393
Nicholson, M. B., Note on Mr Gould's Discussion of Potential Surprise 830
Pitchford, J. D., and Hagger, A. J., A Note on the Marginal Efficiency of Capital... ... 597
Rasmussen, P. N., A Note on the History of the Balanced-budget Multiplier 154
Robinson, J., The Real Wicksell Effect 600
Whetham, E. H., Rent and the Agricultural Price Review... 605

OFFICIAL PAPERS

The Cohen Council on Inflation. By J. C. R. Dow... 610
A Further Note on Finance and Taxation in Jamaica. By D. F. Murray... 835
Mr. Kaldor's Plan for the Reform of Indian Taxes. By U. K. Hicks 160

OBITUARY

John von Neumann, 1903–57. By O. Morgenstern 170

NOTES ON CURRENT TOPICS 174, 396, 628, 840

RECENT PERIODICALS AND NEW BOOKS 176, 399, 631, 843

REVIEWERS

Allen, G. C., 554
Allen, G. R., 139
Baldwin, K. D. S., 387
Bareau, P., 790
Beacham, A., 131
Beesley, M., 561
Bowen, I., 384
Braithwaite, R. B., 146
Briggs, A., 391
Brown, A. J., 792
Carter, C. F., 112, 543
Chilver, G. E. F., 571
Cole, D. E., 124, 567
Cramer, J. S., 546
Cuthbertson, J. R., 121
Deane, P. M., 370, 560
Dennison, S. R., 372
Dow, J. C. R., 359
Dunning, J. H., 368, 815
Erickson, C., 806
Farrell, M. J., 545
Fay, C. R., 822
Florence, P. Sargant, 382, 563
Gertler, M., 136
Goodwin, R. M., 116
Guillebaud, C. W., 126, 128, 549
Hague, D. C., 366
Hahn, F. H., 363
Harrod, R. F., 534
Hawtrey, Sir R., 357
Henderson, R. F., 114
Hicks, U. K., 824
Kirkaldy, H. S., 130, 133, 375, 565, 801, 802
Klein, L. R., 547
Lancaster, K., 794
Liesner, H. H., 556
Lloyd, E. M. H., 135
Macfie, A. L., 25, 780
Macpherson, W. J., 574
Marquand, H. A., 809
Meade, J. E., 365, 541, 550
Mishan, E. J., 786
Nove, A. D., 577
Prest, W., 558
Richardson, J. H., 380
Samuelson, P. A., 539
Sayers, R. S., 353
Seear, B. N., 808
Shackle, G. L. S., 361
Silberston, A., 796, 813
Silcock, T. H., 141
Tew, B., 799
Thistlethwaite, F., 145, 373
Thomas, B., 119
Turner, H. A., 376, 378
Turvey, R., 385
Vaizey, J. E., 804, 820
Walker, G., 817, 819
Warriner, D., 143
Wilson, C., 811
Youngson, A. J., 120, 389, 569

PUBLICATIONS OF THE ROYAL ECONOMIC SOCIETY

	Price to Members £ s. d.	Published Price £ s. d.
A Catalogue of the Library of Adam Smith. Prepared by J. BONAR	12 6	1 1 0
Official Papers. By ALFRED MARSHALL	2 6	10 6
The Letters of David Hume. Edited by J. Y. T. GREIG (2 Vols.)	1 7 6	2 10 0
The Works of Ricardo. Vols. I to X Edited by P. SRAFFA Each vol.	16 0	1 4 0
Walras' Elements of Pure Economics. Edited by W. JAFFÉ	1 8 0	2 2 0
University Teaching of the Social Sciences: Economics. Edited by C. W. GUILLEBAUD	7 0	11 6
Studies in Economic History. By GEORGE UNWIN	1 15 0	2 15 0

Application, including remittance, should be made by Members to:

The Secretary,
ROYAL ECONOMIC SOCIETY,
21 BENTINCK STREET,
LONDON, W.1

ROYAL ECONOMIC SOCIETY

PATRON:

HER MAJESTY THE QUEEN

COUNCIL:

President

SIR ROBERT HALL, K.C.M.G., C.B.

Vice-Presidents

LORD BEVERIDGE, K.C.B., D.Sc., F.B.A.
LORD BRAND, C.M.G.
SIR ALEXANDER CARR-SAUNDERS, K.B.E., LL.D., Litt.D., F.B.A.
PROFESSOR SIR ALEXANDER GRAY, C.B.E.
PROFESSOR SIR RALPH HAWTREY, C.B., F.B.A.
PROFESSOR A. C. PIGOU.
PROFESSOR L. C. ROBBINS, C.B., F.B.A.
PROFESSOR SIR DENNIS ROBERTSON, C.M.G., F.B.A.
PROFESSOR R. H. TAWNEY, F.B.A.

Professor G. C. ALLEN, C.B.E.
Professor R. G. D. ALLEN, C.B.E., F.B.A.
Mr. W. M. ALLEN.
Professor A. J. BROWN.
Professor E. H. PHELPS BROWN, M.B.E.
Sir SYDNEY CAINE, K.C.M.G.
Professor A. K. CAIRNCROSS, C.M.G.
Sir GEOFFREY CROWTHER.
Professor E. DEVONS.
Professor P. SARGANT FLORENCE, C.B.E.
Mr. C. W. GUILLEBAUD, C.B.E.
Professor H. J. HABAKKUK.
Professor H. HAMILTON.
Mr. F. E. HARMER, C.M.G.
Professor J. R. HICKS, F.B.A.
Sir OSCAR HOBSON.
Professor J. JEWKES, C.B.E.
Professor R. F. KAHN, C.B.E.
Professor W. A. LEWIS.
Sir DONALD MACDOUGALL, C.B.E. (*Hon. Secretary*).
Professor J. E. MEADE, C.B., F.B.A.
Mr. H. C. B. MYNORS.
Professor Sir ARNOLD PLANT (*Hon. Secretary*).
Mrs. JOAN ROBINSON, F.B.A.
Professor R. S. SAYERS, F.B.A.
Professor G. L. S. SHACKLE.
Professor J. R. N. STONE, C.B.E., F.B.A.
Professor J. H. B. TEW.
Professor B. THOMAS, O.B.E.
Professor G. J. WALKER.

Professor E. A. G. ROBINSON, C.M.G., O.B.E., F.B.A., *Joint Editor & Secretary.*
Mr. R. F. HARROD, F.B.A., *Joint Editor.*
Mr. R. C. O. MATTHEWS, *Assistant Editor.*
Mr. A. D. MARRIS, C.M.G., *Hon. Treasurer.*
Mr. A. FULLER, *Assistant Secretary.*

Applications for Fellowship should be addressed by letter to the Secretary, Royal Economic Society, 21 Bentinck St., London W.1. The Annual Subscription is thirty shillings. Any Fellow may compound for his future annual subscriptions by paying at once the sum of twenty-two pounds ten shillings, subject, in the case of members who have already paid ten annual subscriptions, to a reduction of five shillings in respect of every year for which such annual subscription has been paid, provided that the composition fee does not fall below seventeen pounds ten shillings. There is at present no entrance fee. Libraries, Institutions and Companies are admitted to the Society with full rights to receive all its publications at an Annual Subscription of thirty shillings. They are entitled to compound their subscriptions for a period of fifteen years on payment of twenty pounds.

Editorial Communications and **Books and Periodicals for Review** should be addressed to the Editor, Royal Economic Society, the Marshall Library, Downing St., Cambridge.

Communications respecting Advertisements should be addressed to the Secretary, Royal Economic Society, The Marshall Library, Downing St., Cambridge.

Printed in Great Britain by Richard Clay and Company, Ltd., Bungay, Suffolk

m